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Implementation of Evidence-Based Practices to Improve Treatment for Patients with Neck Pain: A Pilot Study

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IMPLEMENTATION OF EVIDENCE-BASED PRACTICES TO IMPROVE TREATMENT FOR PATIENTS
WITH NECK PAIN: A PILOT STUDY

By

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Sarah Kaderka

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A doctoral project submitted in partial fulfillment
of the requirements for the

Doctor of Physical Therapy

Department of Physical Therapy
School of Integrated Health Sciences
The Graduate College

University of Nevada, Las Vegas
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Doctoral Project Approval

The Graduate College
The University of Nevada, Las Vegas

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entitled

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Neck Pain: A Pilot Study

is approved in partial fulfillment of the requirements for the degree of

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ABSTRACT

Purpose

To determine physical therapists' barriers to implementation and subsequent maintenance of evidence-based practices (EBPs) for treating neck pain from the American Physical Therapy Association (APTA) neck pain Clinical Practice Guideline (CPG) over the course of six months.

Materials and Methods

Participating physical therapists were trained on the EBPs of treating neck pain through a live 90-minute webinar followed by a hands-on, in-person 90-minute session. Clinics were supplied with all necessary equipment and reference guides. Assessment of participant maintenance to neck pain EBPs included data collection from a baseline *Knowledge Check* survey prior to educational sessions, an *Implementation* survey at two months post educational sessions, and a *Maintenance* survey at six months post educational sessions.

Results

75% of the participants stated that they maintained the use of the recommended EBP guidelines six months after the educational sessions. When participants were asked how often they used the EBPs taught six months previously, 25% responded with, "about half of the time," 50% responded with, "most of the time," and 25% responded with, "always."

The most commonly reported barriers were a high patient caseload, perception that patient outcomes were not improving, availability of one-on-one time with patients, and too short of patient treatment sessions to be able to implement EBP-related interventions for neck

pain effectively. Participants who stated they had a high self-efficacy were more likely to perform mobilizations and use the recommended EBP modalities.

Key Words

Neck pain, cervical pain, physical therapy, physical therapist, implementation, evidence-based practice (EBP), clinical practice guideline (CPG)

IRB Approval Statement

This protocol has been reviewed as indicated in Federal regulatory statutes 45 CFR 46 and deemed exempt as stated in the Review Categories: under categories: 2i and 4.

Word Count

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1. INTRODUCTION

Neck pain is considered one of the most common sources of pain among all ages and can have monetary, social, and economic impacts on affected individuals.¹ An estimated 50% of people experience neck pain at least once in their lives.² Most people who suffer from neck pain report missing work and have a recurrence of pain within a year post-treatment.³ According to Dieleman et al., 134.5 billion dollars was spent treating neck and low back pain out of the total 3.1 trillion dollars spent on healthcare in 2016.⁴ It is essential for physical therapists to efficiently and effectively implement the best evidence-based treatments in their practice to help decrease the overall duration and incidence of their patients' neck pain.

Resources and continuing education are available for physical therapists through organizations such as the APTA, Evidence in Motion, and the Institute of Clinical Excellence. Such organizations provide ways to assist physical therapists in finding the latest research relevant to the physical therapy profession. However, findings from studies indicate that application of this research to their practice remains variable.⁵⁻⁷ Research exploring physical therapist adherence to EBPs for low back pain showed that physical therapists who are APTA members and have acquired specializations have higher adherence to EBPs in general. However, adherence varied based upon specific patient diagnoses.⁸ Results from another study indicated that physical therapists were confident in following the strength and range of motion EBPs for knee osteoarthritis, but not for pain management, weight loss, or aerobic exercise.⁹ This suggests that physical therapists may be selective in their implementation of research into practice. There may be a variety of reasons that evidence does not get implemented into

physical therapy daily practice. A study by Zoubi et al. outlined some barriers that could affect the implementation of research into practice including a lack of awareness, skill, self-capacity, or motivation.¹⁰

The purpose of implementation research is to utilize systematic methods to increase translation of knowledge into practice.¹¹ A small systematic review on the effectiveness of implementation science showed that using information from CPGs, implementing educational sessions with specific interventions, and putting a monitoring system into place after the educational sessions improved physical therapists' adherence to evidence for a variety of musculoskeletal conditions.⁷ However, conflicting results have been found in other studies. An implementation science study done by Beneciuk et al. focused on educating physical therapists on evidence from neck and low back pain CPGs to see if it would improve patient outcomes and physical therapist behaviors.¹² The results concluded that it changed physical therapist behaviors, but not patient outcomes. Given the conflicting evidence, more research needs to be done on long term effects of physical therapist adherence to evidence and patient outcomes.

There is currently limited data surrounding physical therapists' use of current EBPs to treat patients with neck pain. This study had two aims. The first was to determine if outpatient physical therapists were able to maintain the use of the recommended EBP guidelines for treating neck pain over the course of six months. The second was to identify barriers to physical therapist adherence to EBPs of treating neck pain. To identify the unseen barriers to implementation, this study was designed to evaluate how well physical therapists apply EBPs to their daily work when directly provided the most current research.

2. METHODS

Participants

Approval from the Institutional Review Board (IRB) was obtained six months prior to this study's start date. Outpatient physical therapists in southern Nevada were recruited for this study through a *Reach* survey (Appendix A-A1) sent by email to clinic directors of local branches of a national physical therapy corporation. Physical therapists were eligible to participate in this study if they expressed interest, had a license to practice in the state of Nevada, and treated at least one patient with neck pain per month. Physical therapists were excluded if they were not currently licensed or if they did not treat at least one patient with neck pain per month. There were no exclusions based on sex, age, experience, race, or ethnicity. Fifteen physical therapists from thirteen outpatient physical therapy locations were participants in this study (Table 1).

Table 1: Participant Information.

Therapist	Gender	Age Range	Highest PT Degree	Years of Practice	Degree Location	Certifications / Specialties	Residency or Fellowship
1	F	40-49	Bachelor's	20+	St. Jude College, Manila Philippines	None	N
2	M	30-39	DPT	0-3	Mary Baldwin University	None	N
3	F	20-29	Bachelor's	0-3	De La Salle Health Sciences Institute ,Philippines	None	N
4	M	30-39	DPT	0-3	University of Nevada, Las Vegas	COMT	N
5	F	30-39	DPT	13-15	Mount Saint Mary's	OCS	N
6	M	50-59	Bachelor's	20+	Manila, Philippines University of the Philippines	COMT, CDN	N
7	M	30-39	DPT	4-6	Ithaca College	Athletic Trainer, COMT	N
8	M	30-39	DPT	0-3	Touro University of Nevada	None	N
9	F	30-39	DPT	4-6	Touro University of Nevada	None	N
10	M	60+	Bachelor's	20+	University of Utah	COMT	N
11	M	30-30	DPT	7-9	University of St Augustine	None	N
12	M	30-39	DPT	7-9	Nova Southeastern University	SCS, CSCS	N
13	M	30-39	Bachelor's	16-20	University of the East	None	N
14	F	20-29	DPT	4-6	Regis University	Certified Lymphedema Therapist	N
15	M	30-39	DPT	4-6	Northern Arizona University	COMT, Dry Needling	N

Education Implementation

To assess participants' prior knowledge of the EBPs on treating neck pain, physical therapists were sent a baseline *Knowledge Check* at the beginning of the study. Participating physical therapists attended a live 90-minute webinar presented by a physical therapist with a specialty certification in orthopedics. The webinar outlined current EBP recommendations for treating patients with neck pain derived from the most recently published APTA neck pain CPG.¹³ Following the webinar, participants attended an in-person, 90-minute hands-on session presented by the same physical therapist with a specialty certification in orthopedics, to learn the manual skills of the EBPs of neck pain. The learning objectives for the online lecture and in-person laboratory sessions are shown in Table 2.

Table 2: Learning objectives for the lecture and lab educational sessions.

Objective 1	Physical therapists will demonstrate comprehension of curriculum knowledge from the APTA neck pain CPG via a <i>Knowledge Check</i> survey.
Objective 2	Physical therapists will demonstrate the hands-on interventions from the four categories of neck pain in a correct and efficient manner.

At the in-person, hands-on session, participants practiced and received feedback on specific skills recommended for neck pain as demonstrated by the orthopedic certified specialist. These skills included interventions for four different categories of neck pain: Neck

Pain with Mobility Deficits, Neck Pain with Headaches, Neck Pain with Movement Coordination Impairment (MCI), and Neck Pain with Radiculopathy (Table 3).¹³ Participating therapists were provided a lab handout of all interventions that were demonstrated, all equipment necessary to perform the treatments (Figures 1-2), and video copies of the information presented during the webinar and in-person sessions (Appendix B).

Table 3: Interventions taught in lab sessions for the four categories of neck pain.¹³

	Neck Pain with Mobility Deficits	Neck Pain with Headaches	Neck Pain with MCI	Neck Pain with Radiculopathy
Interventions	<ul style="list-style-type: none"> • Cervical mobilization • Cervical manipulation • Cervical muscle energy techniques 	<ul style="list-style-type: none"> • Cervical flexion-rotation test • C1-2 SNAG • AA rotation contract-relax 	<ul style="list-style-type: none"> • Deep neck flexors training with biofeedback • Joint position error training 	<ul style="list-style-type: none"> • Cervical traction glide • Clinical prediction rule for cervical radiculopathy

Figure 1: A biofeedback cuff is used to train the deep neck flexors for patients with neck pain with MCI.



Figure 2: Equipment for joint position error training for patients with neck pain with MCI includes a laser headlamp and a target positioned approximately three feet away from the patient.



Data Collection

Therapists who responded to the *Reach* survey were emailed a follow-up *Adoption* survey (Appendix A-A3) to determine their demographics and education levels. Therapists who responded to the *Adoption* survey were then emailed information regarding the study and asked to complete the baseline *Knowledge Check* survey (Appendix A-A2). The baseline *Knowledge Check* survey consisted of nine questions derived from information found in the most recent APTA neck pain CPG, with a maximum score of 9. A higher score on the questionnaire indicated a greater knowledge about interventions for neck pain.

The use of EBPs over the course of six months was assessed through an *Implementation* survey (Appendix A-A4) and a *Maintenance* survey (Appendix A-A5). A panel of four physical therapists outside the study reviewed the surveys prior to distribution to assess for face validity and made no changes. Two months after both the webinar and hands-on sessions took place, an *Implementation* survey was distributed to assess participant implementation of the neck pain EBPs. The *Implementation* survey contained questions that were designed to assess physical therapists' frequency of using the EBPs over two months, barriers to using EBPs, which EBPs they chose to use, if they used the equipment as instructed, and the effectiveness of using EBPs in daily practice. Six months after the webinar and hands-on sessions, an additional mixed-methods *Maintenance* survey was distributed to assess change over time. The *Maintenance* survey contained questions that were designed to assess physical therapists' maintenance of EBPs over six months, barriers to using EBPs, effectiveness of using EBPs in daily practice, confidence in ability to apply EBPs, and if they had made changes to the recommended EBP

guidelines that were provided to them. All surveys for this study were modeled after a previously validated questionnaire.¹⁴

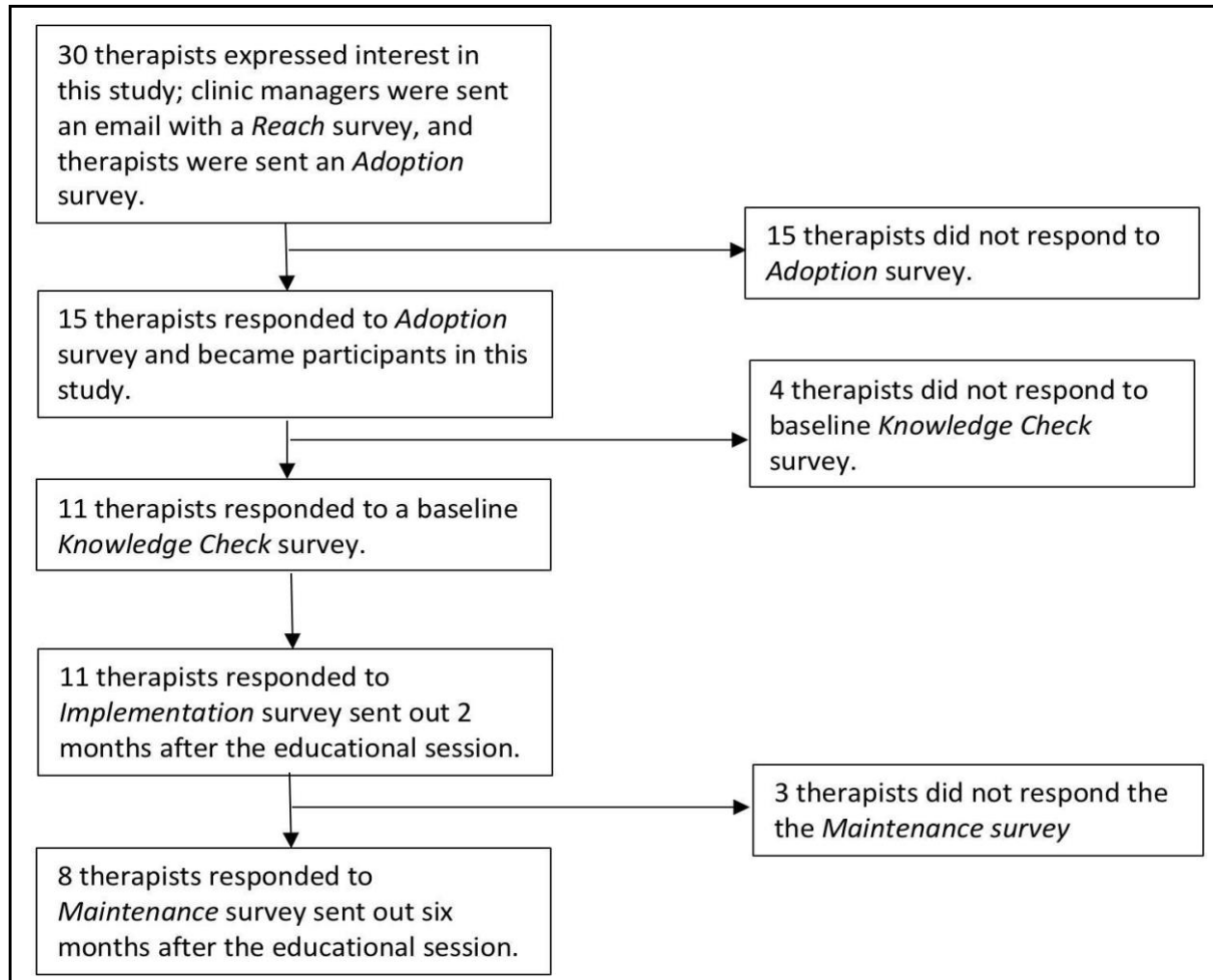
Data Analysis

For the purposes of this study, the barriers found were grouped into Personal Limitations, Evidence-Related Barriers, and External Factors. Personal Limitations could include decreased awareness of available evidence, lack of access, difficulties with evidence interpretation, or challenges applying evidence to specific patient populations.⁷ Evidence-Related Barriers could include a lack of research, increased complexity of research studies making it difficult to implement into practice, lack of access to research, and other limitations that could affect the applicability of interventions. External Factors could include the lack of time or resources, reduced ability to work as a team, and the desire to fit into the culture of a clinic that does not use evidence.

3. RESULTS

This study evaluated how well physical therapists apply EBPs to their daily work when directly provided the most current research. The two aims of this study were to determine if outpatient physical therapists were able to maintain the use of the recommended EBP guidelines for treating neck pain over the course of six months, and to identify barriers to physical therapist adherence to EBPs for treating neck pain. Not all participants completed all surveys, so data from the *Implementation* and *Maintenance* surveys were analyzed together. Participant recruitment and retention throughout the six-month period in which this study took place is shown in Figure 3.

Figure 3: Participant recruitment and retention flowchart.



Over the duration of the study, only five out of fifteen participants in total responded to all surveys, while the other participants responded to some surveys, but not all. Data was analyzed from all available responses, regardless of whether each participant responded to every survey.

Implementation and Maintenance of EBPs

For the purposes of this research study, the survey questions related to the two aims are shown in the tables below (Tables 4-5). Not all participants responded to every survey question (for reasons unknown), so only the responses that were received are reflected in the following tables.

Table 4: Participant responses to frequency of implementation (n=11).

	Never	Sometimes	About Half of the Time	Most of the Time	Always
<i>How often have you used EBP guidelines when treating your patients with neck pain in the past two months?</i>	0	2	1	6	2
<i>In the past two months, how often did you use the biofeedback cuff for cervical endurance assessment and treatment?</i>	3	4	1	1	2
<i>In the past two months, how often did you use the laser headlamp for patients where it was appropriate?</i>	3	5	0	3	0
<i>In the past two months, how often did you use cervical joint mobilization on appropriate patients with neck mobility deficits?</i>	1	1	3	5	1
<i>In the past two months, how often did you use cervical joint manipulation on appropriate patients with neck mobility deficits?</i>	7	1	1	2	0
<i>*How often have you maintained the use of the recommended EBPs you were taught six months ago?</i>	0	0	2	4	2

*3 participants did not respond to *Maintenance* survey where question was displayed

Table 5: Participant responses to ‘Yes/No’ questions on *Implementation* and *Maintenance* surveys (n = 11).

	Yes	No	Somewhat
<i>Have you used EBP guidelines on all appropriate patients with neck pain?</i>	9	2	0
<i>Is the amount of time that is required to use the EBP guidelines reasonable?</i>	10	1	0
<i>Did you use the biofeedback cuff as instructed?</i>	9	2	0
<i>Did you use the laser headlamp as instructed?</i>	10	1	0
<i>*Have you maintained the use of the recommended evidence based on guidelines you were taught six months ago?</i>	6	0	2

*3 participants did not respond to *Maintenance* survey where question was displayed

Barriers to Implementation of EBPs

Participants’ responses to qualitative questions that were designed to identify the barriers found to implementing EBPs in their respective clinics can be found in Appendix C.

After all the data was received at the end of the six-month timeframe, it was revealed that the last three questions were not displayed to the therapists due to technological issues.

Participants’ opinions regarding use of EBPs can be found in Table 6.

Table 6: Participant opinions regarding use of EBPs (n=11).

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
<i>The recommended EBP assessments and treatments for neck pain are easy to conduct.</i>	2	9	0	0	0
<i>The methodology behind EBPs for neck pain are reasonable and appropriate.</i>	4	7	0	0	0
<i>*I consider it necessary to apply EBPs in the daily practice of physical therapy.</i>	6	2	0	0	0
<i>*I feel confident in my ability to treat my patients with neck pain according to current evidence.</i>	6	2	0	0	0

*3 participants did not respond to the Maintenance survey where the question was displayed.

All participants that responded agreed or strongly agreed that the recommended interventions were easy to conduct and appropriate (Table 6). All participants also stated that the EBPs were worthy of routine use and beneficial for patients.

4. DISCUSSION

Implementation and Maintenance of EBPs Over Six Months

The first aim of this study was to determine if outpatient physical therapists implemented and maintained the use of the recommended EBP guidelines for treating neck pain over the course of six months. According to the results, 75% of the participants who responded to the surveys stated that they were able to maintain the use of EBPs over six months, and over 80% of participants who responded used all recommended equipment as instructed. This shows that utilizing educational sessions to implement the use of EBPs of treating neck pain, does work over the span of six months. However, it should be noted that had all participants responded to all surveys, results may have differed.

Over half of participants stated that they were able to maintain the use of EBPs over the course of six months, suggesting that educational sessions could have long-lasting benefits on the application of research into practice. The results suggest that if participants were already confident in performing the EBPs in daily practice, they were more likely to implement and maintain their usage of the CPG's recommendations. The results also found that participants who stated they had a high self-efficacy were more likely to perform mobilizations and use the recommended EBP modalities. It is recommended to continue this research with future studies to determine if this is generalizable to a larger population and if it will have effects for longer than six months.

Barriers to Implementation of EBPs

The most reported barriers to research implementation include a high patient caseload, perception that patient outcomes were not improving, lack of availability of one-on-one time

with patients, and too short of patient treatment sessions to be able to implement or educate on EBP-related interventions on neck pain effectively. In a clinical setting where therapists have more time to spend with patients and utilize the recommendations as the research intended, there may be fewer barriers and higher implementation rates of EBPs.

Based on the responses that were collected, the reason those that did not utilize EBP on all appropriate patients could be attributed to a therapist's ability to perform the recommended guidelines. These could include a lack of time, low clinician self-efficacy to perform recommended interventions, or other unknown barriers. Additionally, inability of physical therapists to properly incorporate the biofeedback cuff and laser headlamp (Figures 1-2) into practice as instructed during the hands-on session could contribute as a barrier. Reasons for this barrier could be attributed to misuse of equipment or additional time required to train other staff. As such, physical therapists may determine other non-EBP interventions as the best use of available time spent with patients across their continuum of care.

Limitations:

The first limitation for this study was physical therapist's inconsistency with attendance of educational sessions and filling out surveys. Twelve participants attended the live webinar, and thirteen attended the in-person hands-on session. Of those that attended the live webinar, only nine participants also attended the in-person, hands-on session. In regards to filling out the surveys, eleven participants completed the *Knowledge Check*, eleven completed the *Implementation* survey, and eight completed the *Maintenance* survey. The total number of therapists that were able to attend both the live webinar and in-person hands-on session, as well as fill out all required surveys was five. Therefore, conclusions cannot be made about

participants that did not fill out the surveys. Another limitation of this study included technological problems where the surveys did not display the follow-up questions as expected, eliminating the ability to elaborate on these questions. To address this, test surveys could have gone out to a larger group to detect potential problems prior to administering the final surveys to the research participants. The final limitation of this study is the lack of a post-study knowledge check. A post-study knowledge check could have allowed analyses to be performed on whether the therapists were able to retain the knowledge that was taught to them six months prior.

5. CONCLUSION

Upon completion of this study, 75% of survey respondents stated that they maintained the use of recommended interventions, with 100% of respondents stating they would continue to use it in the future. There were two most common barriers for the translation of knowledge into practice. The first was a lack of one-on-one time with patients to perform treatments due to a high patient caseload. The second was a decreased self-efficacy with performing the recommended EBP modalities which led to decreased implementation of recommendations found in the neck pain CPG. The results from this study suggest that it may be beneficial to implement regular educational and laboratory sessions in outpatient physical therapy clinics. Continuing education sessions could increase therapists' self-efficacy about their ability to perform current EBPs of neck pain as new research gets published. Future research studies could expand on the findings from this study or apply educational sessions for the treatment of other common impairments such as low back pain to see if pathology plays a role in the implementation of research into practice.

APPENDIX A - Surveys

A1 - Reach Survey

1. Do you give consent for your clinic to participate in this research study?

-Yes/No:

-If no, please tell us the reason(s) why:

A2 - Knowledge Check Survey

1. Which of the following criteria are appropriate to determine if stable adult patients with neck pain precipitated by trauma would benefit from imaging of the cervical spine?

- a. CCR (Canadian Cervical Spine Rule)
- b. NEXUS (National Emergency X-Radiography Utilization Study)
- c. ACR (2001 American College of Radiology (ACR) suspected Spine Trauma Appropriateness Criteria)
- d. A and B
- e. A and C
- f. B and C
- g. All of the above
- h. I am not sure.

2. The majority of patients who present with complaints of neck pain and neck related symptoms of the upper quarter tend to have a pathoanatomical cause.

- a. True
- b. False

c. I am not sure

3. Mobilization and manipulation for mechanical neck disorders is less effective when not combined with exercise interventions.

a. True

b. False

c. I am not sure

4. The following are moderate to high level prognostic risk factors for the development of new-onset neck pain.

a. Female

b. Smoker

c. Old Age

d. Prior history of neck pain

e. A and D

f. I am not sure

5. The following is not recommended as an intervention for patients with chronic neck pain with headache.

a. Cervical or cervical thoracic manipulation

b. Endurance exercise

c. Dry needling

d. Strengthening

e. I am not sure

6. Patient is a 18-year-old high school student who was in a rear-ended MVA 3 weeks ago. Currently complaining of neck pain and a headache originating from the occipital area. Patient has a negative radiograph. They also report mild dizziness, nausea, and decreased cervical range of motion. Based on this initial report, which pathology is MOST likely?

- a. Cervical facet joint syndrome
- b. Cervical radiculopathy
- c. Whiplash associated disorder
- d. Cervicogenic headache
- e. I am not sure

7. A physical therapist examines a patient who states "I started experiencing neck pain and pain that goes all the way down my right arm into my hand 3 weeks ago. I don't remember doing anything to injure myself, but I did start a new job as a finance manager one month ago that has been a little stressful. I feel a sharp burning 5-6/10 pain on and off throughout the day. At most, it lasts 45 min. It is worst at night when I'm trying to sleep, when I'm working on the computer for more than an hour, and when I turn to look at my kids in the backseat of my car. It feels better after I get a massage, when I use my heating pad, or when I rest my hands on my head." During the exam patient has a positive Spurlings, positive distraction test, negative ULTT 1, positive ULTT

2b. What diagnosis category does the patient belong in?

- a. Neck pain with headache
- b. Neck pain with mobility deficit

- c. Neck pain with radiating pain
- d. Neck pain with movement coordination impairments
- e. I am not sure

8. A physical therapist examines a patient who states "I started experiencing neck pain and pain that goes all the way down my right arm into my hand 3 weeks ago. I don't remember doing anything to injure myself, but I did start a new job as a finance manager one month ago that has been a little stressful. I feel a sharp burning 5-6/10 pain on and off throughout the day. At most, it lasts 45 min. It is worst at night when I'm trying to sleep, when I'm working on the computer for more than an hour, and when I turn to look at my kids in the backseat of my car. It feels better after I get a massage, when I use my heating pad, or when I rest my hands on my head." During the exam patient has a positive Spurlings, positive distraction test, negative ULTT 1, positive ULTT

2b. What treatment option would be best for this patient today?

- a. Suboccipital soft tissue mobilization
- b. Gentle cervical distraction
- c. Core strengthening with forearm planks: 3 sets of 30 second hold
- d. Upper trapezius stretching
- e. I am not sure

9. A physical therapist examines a patient who states "I started experiencing neck pain and pain that goes all the way down my right arm into my hand 3 weeks ago. I don't remember doing anything to injure myself, but I did start a new job as a finance manager one month ago that has been a little stressful. I feel a sharp burning 5-6/10

pain on and off throughout the day. At most, it lasts 45 min. It is worst at night when I'm trying to sleep, when I'm working on the computer for more than an hour, and when I turn to look at my kids in the backseat of my car. It feels better after I get a massage, when I use my heating pad, or when I rest my hands on my head." During the exam patient has a positive Spurlings, positive distraction test, negative ULTT 1, positive ULTT

2b. Your first therapy in Part 2 was effective. What intervention would you like your patient to complete at home?

- a. Right upper trap stretch: 3 sets of 30 second
- b. Child's pose stretch: 3 sets of 1 min
- c. Strengthening of cervical extensors: 3 sets of 10
- d. Home cervical traction: 5-10 min
- e. I am not sure

A3 - Adoption Survey

1. What is your age?

- _____years old

2. What is your gender?

- _____

3. What is your ethnicity?

- _____

4. How many years have you worked as a practicing physical therapist?

- _____years

5. Please circle your highest level of physical therapy education:

- < 2 years
- 2 years
- 3 years/Bachelors degree
- Masters degree (1 year)
- Masters degree (3 years)
- PhD
- Doctoral

6. Do you have any certifications or specialties?

-Yes/No: _____

-If yes, please tell us what they are:

7. How much time (on average) would you say you spend with each patient?

- _____

6. Do you wish to participate in this study?

-Yes/No:

-If no, please tell us the reason(s) why:

A4 – Implementation Survey

PART 1

1. How often have you used evidence-based practice (EBP) guidelines when treating your patients with neck pain in the past 2 months?

- a. Never
- b. Sometimes
- c. About half the time
- d. Most of the time
- e. Always

○ 1A. If sometimes or never, what has been your biggest barrier?

a. _____

2. Have you used EBP guidelines on all appropriate patients with neck pain?

- a. No
- b. Yes

○ 2A. If no, please tell us the reason(s) you did not use EBP on all appropriate patients:

a. _____

3. Please state the average amount of time spend performing one-on-one treatment with your patients with neck pain:

- a. < 10 min
- b. 10-20 min
- c. 20-30 min
- d. 30-40 min
- e. > 40 min

4. Please state the average amount of time spent performing manual therapy treatment on your patients with neck pain:

- a. < 10 min
- b. 10-20 min
- c. 20-30 min
- d. > 30 min

5. Is the amount of time that is required to use the EBP guidelines reasonable?

- a. No
- b. Yes
 - 5A. If no, what do you believe is the barrier to having enough time to use EBP on all appropriate patients with neck pain:

a. _____

6. In the past 2 months, how often did you use the biofeedback cuff for cervical endurance assessment and treatment?

- a. Never
- b. Sometimes
- c. About half the time
- d. Most of the time
- e. Always

- 6A. If never or sometimes, what do you feel is the barrier to using the biofeedback cuff more frequently?

a. _____

7. Did you use the biofeedback cuff as instructed?

- a. No

b. Yes

- 7A. If no, please tell us HOW it was used differently than instructed:

a. _____

8. In the past 2 months, how often did you use the laser headlamp for patients where it was appropriate?

a. Never

b. Sometimes

c. About half the time

d. Most of the time

e. Always

- 8A. If never or sometimes, what do you feel is the barrier to using the laser headlamp more frequently?

a. _____

9. Did you use the laser headlamp as instructed?

a. No

b. Yes

- 9A. If no, please tell us HOW it was used differently than instructed:

a. _____

10. In the past 2 months, how often did you use cervical joint mobilization on appropriate patients with neck mobility deficits?

a. Never

b. Sometimes

c. About half the time

d. Most of the time

e. Always

- 10A. If sometimes or never, what do you feel is the barrier to you performing this treatment with your patients where it is indicated?

a. _____

11. In the past 2 months, how often did you use cervical manipulation on appropriate patients with neck mobility deficits?

a. Never

b. Sometimes

c. About half the time

d. Most of the time

e. Always

- 11A. If sometimes or never, what do you feel is the barrier to you performing this treatment with your patients where it is indicated?

a. _____

PART 2

21. Please select how much you agree with the following statement: The recommended EBP assessments and treatments for neck pain are easy to conduct.

a. Strongly disagree

b. Somewhat disagree

c. Neither agree nor disagree

d. Somewhat agree

e. Strongly agree

22. Please select how much you agree with the following statement: The methodology behind EBP for neck pain are reasonable and appropriate.

a. Strongly disagree

b. Somewhat disagree

c. Neither agree nor disagree

d. Somewhat agree

e. Strongly agree

23. How effective were the recommended EBP guidelines in helping you make decisions about your treatment plans for patients with neck pain?

a. Very ineffective

b. Quite ineffective

c. Moderately effective

d. Effective

e. Very effective

24. Is the level of effectiveness enough to make the EBP guidelines worthy of routine use?

a. Definitely not

b. Probably not

c. Might or might not

d. Probably yes

e. Definitely yes

25. Do the patients see the benefit of using updated treatments in their plan of care?

a. No benefit

b. Slightly beneficial

c. Moderately beneficial

d. Beneficial

e. Very beneficial

26. How has the implementation of the EBP guidelines affected your overall satisfaction with the treatment you provide your patients with neck pain?

a. Not at all satisfied

b. Slightly satisfied

c. Moderately satisfied

d. Very satisfied

e. Completely satisfied

A5 – Maintenance Survey

1. Please choose the response that you most agree with in response to the following statement:

I consider it is necessary to apply evidence-based practice (EBP) into the daily practice of physical therapy.

a. Strongly agree

b. Agree

- c. Neutral
 - d. Disagree
 - e. Strongly disagree
2. Please choose the response that you most agree with in response to the following statement:

I think it created unreasonable demands to apply EBP in my daily work.

- a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
3. Please choose the response that you most agree with in response to the following statement:

Strong evidence is lacking for most treatments that I use for my patients with neck pain.

- a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
4. Please choose the response that you most agree with in response to the following statement:

In general, how confident are you in applying recommendations from the APTA Academy of Orthopaedics

- Rated 0-10

5. Please choose the response that you most agree with in response to the following statement:

I feel confident in my ability to treat my patients with neck pain according to current evidence.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

6. Have you maintained the use of the recommended evidence based guidelines you were taught six months ago?

- Yes/Somewhat/No:

- i. If yes, please tell us the reason(s) you have continued to use the recommended guidelines:

a. _____

- ii. If yes or somewhat, please tell us how often you used the recommended guidelines for neck pain in your clinical practice:

- a. Never
- b. Sometimes

- c. About half the time
- d. Most of the time
- e. Always

iii. If no, please tell us the reason(s) you stopped using the recommended guidelines or if you never used them at all:

a. _____

7. Since the educational sessions, have you made any adaptations to the recommended guidelines to accommodate the specific needs of your clinic?

- Yes/No:

i. If yes, please tell us what adaptations were made and why:

a. _____

8. Will you continue to use the recommended guidelines for neck pain in the future?

- Yes/No:

9. Do you have any further input, suggestions, or general concerns?

APPENDIX B – Education Materials

UNIVPT

Cervical Rehabilitation Lab

Cervical Rehabilitation Lab

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• <u>Neck Pain with Mobility Deficits</u>	<u>Page</u> 2-5
• <u>Neck Pain with Headaches</u>	<u>Page</u> 6- 7
• <u>Neck Pain with MCI</u>	<u>Page</u> 8-10
• <u>Neck Pain with Radiculopathy</u>	<u>Page</u> 11-13

List for Lab Demonstration:

- Neck Pain with Mobility Deficits
 - Cervical Mobilization/ Manipulation
 - Cervical MET
- Neck Pain with Headaches
 - Cervical Flexion Rotation Test
 - AA joint rotation contract-relax
 - C1-2 self SNAG
- Neck Pain with MCI
 - Training of the Deep Neck Flexors
 - Joint Position Sense
- Neck Pain with Radiculopathy
 - Clinical Prediction Rule for Cervical Radiculopathy
 - Traction glide

Neck Pain with Mobility Deficits:

Acute	Subacute	Chronic
<p>Manual Therapy:</p> <ul style="list-style-type: none"> ▪ Cervical mobilization or manipulation ▪ Thoracic manipulation ▪ Cervical ROM, stretching, MET <p>Ther Ex:</p> <ul style="list-style-type: none"> ▪ Cervical isometric strengthening ▪ Cervico-scapula-thoracic and UE stretching, strengthening, and endurance training <p>Education:</p> <ul style="list-style-type: none"> ▪ Advice to stay active ▪ HEP: cervical ROM and isometric exercise <p>Modalities:</p> <ul style="list-style-type: none"> ▪ Pain control 	<p>Manual Therapy:</p> <ul style="list-style-type: none"> ▪ Cervical mobilization or manipulation ▪ Thoracic manipulation <p>Ther Ex:</p> <ul style="list-style-type: none"> ▪ Cervicoscapulothoracic endurance exercise 	<p>Manual Therapy:</p> <ul style="list-style-type: none"> ▪ Cervical mobilization ▪ Thoracic manipulation ▪ Dry needling <p>Ther Ex:</p> <ul style="list-style-type: none"> ▪ Cervicoscapulothoracic: Stretching; strengthening; endurance training; aerobic conditioning <p>Neuromuscular exercise:</p> <ul style="list-style-type: none"> ▪ Coordination, proprioception, and postural training <p>Education:</p> <ul style="list-style-type: none"> ▪ "Stay active" lifestyle approaches <p>Modalities:</p> <ul style="list-style-type: none"> ▪ Intermittent mechanical traction, TENS, electrical muscle stimulation



Assessment



Cervical spine quadrant active range of motion with overpressure

Passive Accessory Intervertebral Movements:

Used for EKam and Treatment

	Central PAs
	Unilateral PAS



Transverse

Cervical Muscle Energy Techniques:

Autogenic Inhibition:

- Cervical motion is taken to a range just short of pain or where resistance is first noted.
- A submaximal isometric contraction (10-20%) is performed **AWAY** from the restriction for 5-10 seconds.
- After the isometric contraction, a gentle stretch is applied to take up the slack till thenew barrier.
- Starting from the new barrier, the procedure is repeated~ 2-5 times

Reciprocal Inhibition:

- Cervical motion is taken to a range just short of pain or where resistance is first noted.
- A submaximal isometric contraction (10-20%) is performed **TOWARDS** from the restriction for 5-10 seconds.
- After the isometric contraction, a gentle stretch is applied to take up the slack till thenew barrier.
- Starting from the new barrier, the procedure is repeated~ 2-5 times

Passive Physiological Intervertebral Movements:



Side Glide



Cervical passive physiologic up glide:



Cervical passive physiologic side glide-up glide combination:

Cervical Manipulation**Mid-Cervical Spine Upslope Technique - (Cradle Hold and Chin Hold)**

Description: This is a technique that uses rotation as the primary lever. It is a two-handed technique in which the non-thrusting hand is critical for speed and control. The patient is supine and their head on a pillow. The therapist applies the proximal phalanx of their index finger onto the lamina behind the transverse process of the affected segment. A primary lever of *contra/ateral rotation* is introduced, followed by an *ipsilateral side-bending* and *slight extension*. The non-thrusting hand is placed on the other side of the head. A thrust into a small amount of rotation is applied once the barrier is fully engaged with the addition of the other levers. The thrusting hand moves the patient into the primary lever of rotation while the opposite hand assists with rotation by moving into the pillow simultaneously.

When to use: Pain with rotation and/or side-bending to the same side, or loss of unilateral rotation and side-bending to the same side.

Contact points:

- Proximal phalanx of second finger contacts lamina behind transverse process of the superior segment.
- **Cradle hold:** The opposite hand moves to the side of the head. The therapist's web space should be just behind the patient's ear.
- **Chin hold:** The opposite hand reaches around and contacts the chin, while the corner of the patient's head rests in the axilla. The therapist's same forearm rests on the side of the patient's head and face just anterior to the ear.

Position for the thrust:

- Primary lever of *contralateral/rotation* is introduced until you feel the lamina of the superior segment come into your proximal phalanx of the thrusting hand.
- *Ipsilateral side-bending* to the level is then followed by slight extension.

Application of thrust:

- The thrust is applied along the plane of the facet joint and into rotation around the vertex of the head *toward the opposite eye*.
- **Cradle hold:** The opposite hand drops or is thrown into the pillow at the same time.
- **Chin hold:** The opposite arm drops into the pillow at the same time. The thrust is not initiated through the chin but with the thrusting hand and opposite forearm.

Keys to success:

- It is important to have the patient's head resting on a pillow to minimize tension in the neck that often occurs when lifting the head or having the head completely off the table.
- The table should be at a level where the therapist can handle the patient's head without much bend in their elbows.

Mid-Cervical Spine Downslope Technique - (Cradle Hold and Chin Hold)

Description: This is a technique that uses side-bending as the primary lever. It is a two-hand technique in which the non-thrusting hand is critical for speed and control. The patient is supine with their head on a pillow. The therapist applies the proximal phalanx of their index finger onto the most lateral portion of the lamina of the affected segment. A primary lever of ipsilateral side-bending is introduced, followed by contralateral rotation and slight extension. The non-thrusting hand is placed on the other side of the head. A thrust into a small amount of side-bending is applied once the barrier is fully engaged. The direction of the thrust should be toward the patient's opposite axilla. The thrusting hand moves the patient into the primary lever of side-bending while the opposite hand assists by moving the head into side-bending simultaneously.

When to use: Pain with rotation and/or side-bending to the same side, or loss of unilateral rotation and side-bending to the same side.

Contact points:

- Proximal phalanx of second finger contacts the lateral aspect of the lamina just behind the transverse process of the superior segment.
- **Cradle hold:** The opposite hand moves to the side of the head. The therapist's web space should be just behind the patient's ear.
- **Chin hold:** The opposite hand reaches around and contacts the chin, while the corner of the patient's head rests in the axilla. The therapist's same forearm rests on the side of the patient's head and face just anterior to the ear.

Position for the thrust:

- Primary lever of *ipsilateral/ side-bending* is introduced until you feel the lamina of the superior segment come into your proximal phalanx of the thrusting hand.
- *Contralateral rotation* to the level is then followed by slight extension.

Application of thrust:

- The thrust is applied downward along the plane of the facet joint and into side-bending. The therapist should aim toward an area between the patient's sternum and opposite axilla. The axis of motion is around the patient's nose.
- **Cradle hold:** The opposite hand is pulled into the therapist's chest simultaneously.
- **Chin hold:** The opposite arm and hand is pulled into the therapist's chest simultaneously. The hand on the chin is only resting around the chin and is not used to apply additional force or leverage.

Keys to success:

- Caution must be used with excessive side-bending and/or translation as it places too much stress on the contralateral tissues and can cause injury to the patient.

**Content adapted from Te(t: Puenteudura, E (2018). Thrust Joint Manipulation Skills for the Spine.

Neck Pain with Headaches:

Acute	Subacute	Chronic
<p>Ther Ex:</p> <ul style="list-style-type: none"> ■ C1-2 self SNAG 	<p>Manual Therapy:</p> <ul style="list-style-type: none"> ■ Cervical mobilization or manipulation <p>Ther Ex:</p> <ul style="list-style-type: none"> ■ C1-2 self SNAG 	<p>Manual Therapy:</p> <ul style="list-style-type: none"> ■ Cervical mobilization ■ Cervical manipulation ■ Thoracic manipulation <p>Ther Ex:</p> <ul style="list-style-type: none"> ■ Deep neck flexor strengthening ■ Cervical and scapulothoracic strengthening and endurance exercise <p>Neuro Re-education</p> <ul style="list-style-type: none"> ■ Neuromuscular training, including motor control and biofeedback elements

Assessment



Cervical Flexion Rotation Test

Improving upper cervical mobility



Anterior-posterior O-C1

(Atlanto-occipital (OA) joint mobilization)



Upper cervical posterior-anterior mobilizations



Cervical passive physiologic side glide assessment and treatment

Improving sub-occipital muscle flexibility



Suboccipital post isometric relaxation



Suboccipital soft tissue mobilization



Atlanto-axial (AA) joint rotation contract-relax

The patient lies supine while the clinician passively flexes the cervical spine maximally to end-range. The clinician then passively rotates the head left and right ensuring the cervical spine does not drift into side flexion or back into extension. While maintaining rotation, the patient is instructed to look into contralateral rotation with their eyes holding for 10 seconds, then have the patient relax. As the patient relaxes, the therapist gently moves the patient into an increased rotation ROM if possible. This is generally performed for 3 repetitions.

Cervicoscapular muscle soft tissue mobilization



Levator scapulae soft tissue mobilization



Upper trapezius soft tissue mobilization



Cervical paraspinals soft tissue mobilization

Sustained Natural Apophyseal glide (SNAG)



Self towel cervical sustained natural apophyseal glide (SNAG)

Neck Pain with Movement Coordination Deficits

Acute	Subacute	Chronic
<ul style="list-style-type: none"> Manual Therapy <ul style="list-style-type: none"> Pain reducing treatments Home exercise Program <ul style="list-style-type: none"> Pain-free cervical ROM and postural element Patient Education <ul style="list-style-type: none"> Advice to remain active, act as usual Minimize collar use Prognosis <ul style="list-style-type: none"> Quick and early recovery Monitor for acceptable progress 	<ul style="list-style-type: none"> Patient Education <ul style="list-style-type: none"> Activation and counseling Manual Therapy: <ul style="list-style-type: none"> Cervical mobilization or manipulation Ther Ex <ul style="list-style-type: none"> Active cervical ROM or stretching, strengthening, endurance, neuromuscular exercise including postural, coordination, and stabilization elements. Modalities <ul style="list-style-type: none"> Ice, Heat, TENS Prognosis <ul style="list-style-type: none"> Prolonged recovery trajectory 	<ul style="list-style-type: none"> Patient Education <ul style="list-style-type: none"> Prognosis, encouragement, reassurance, pain management, PNE Manual Therapy <ul style="list-style-type: none"> Cervical mobilization plus individualized progressive exercise Ther Ex <ul style="list-style-type: none"> Low-load cervicospulothoracic strengthening, endurance, flexibility, Vestibular Rehabilitation <ul style="list-style-type: none"> Eye-head-neck coordination, neuromuscular coordination elements Modalities <ul style="list-style-type: none"> TENS if needed

Deep Neck Flexor Strength Deficits:

Commonly Associated with Neck pain with headaches (Cervicogenic Headaches) as well as Neck pain with movement coordination impairments such as: Whiplash Associated Disorder (WAD), or Cervical Sprain/Strain



Craniocervical Flexion Test



Neck Flexor Endurance Test



Training of the Holding Capacity of the Deep Neck Flexors

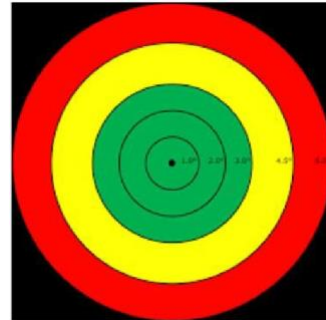
Once the patient can correctly perform the CCF movement, training to improve the holding capacity of the deep flexors is begun.

The starting point for holding capacity training (HCT) usually is the pressure level the patient can hold without compensation for at least 10 seconds. Patients commonly start at 22 or 24 mm Hg. The training consists of teaching the patient to achieve the determined pressure level and then to hold it for a time without evidence of compensation or poor motor patterns. Ideally the patient is asked to practice the exercise at least twice a day. For each pressure level, the patient holds the position for 10 seconds and repeats this 10 times. Reaching an ideal pressure level between 28 and 30 mm Hg.

Cervical Joint Position Sense

Altered Cervical Joint Position Sense or Proprioception is often associated with Neck pain with Headaches as well as Neck Pain with Headaches. Movement Coordination Impairments such as Cervical Sprain/Strain or WAD Type II

- Ability to relocate neutral head posture with eyes closed
- Joint position error (JPE) = angular difference between starting postural position and that assumed after a neck movement
- Goal to stay in the green
- Errors commonly occur in return from extension and rotation
- Return from flexion and lateral flexion may also be assessed
- Can also assess accuracy in relocating selected points in range or with tracing patterns



STEPS:

- Have patient sit~ 3 ft (90 cm) away from wall
- Mark the starting position of the projected laser on wall with center of target
- Ask patient to close eyes, move into extension, then "relocate" start position
- Second mark placed on wall
- Measure difference between two marked points in centimeters as negative or positive value (undershoot/ overshoot)

INTERPRETATION:

- JPE > 7 cm or > 4.5° of error suggests *abnormal cervical proprioception*

Progression and Postural Re-education

Retraining in an upright position

Endurance training of the scapular stabilizers



Retraining of cervical spine extension in the upright position.



Deep neck flexor training in an upright position.



Alternating cervical protraction and retraction.



Retraining of the cervical spine extensors A. Neutral B. Nod C. Flexion



Training of the scapular stabilizing muscles. The pt trains the scapulae in both eccentric and concentric control and in holding capacity.

A. Scapula winging.

B. Scapula engaged.

Alternate position= quadruped.



Advanced cervical stabilization exercises. A. 2-dimensional exercises. B. 3-dimensional exercises

Sensorimotor training and cervical stabilization.

A. Quadruped position.

B. Pt lifts one leg.

C. Pt lifts one leg and the opposite arm.

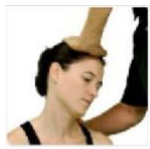
D. Pt lifts a leg and the opposite arm while maintaining head posture holding a book.



Neck Pain with Radicular Pain

Acute	Chronic
<p>Manual Therapy:</p> <ul style="list-style-type: none"> ■ Cervical/ Thoracic mobilizations <p>Ther Ex:</p> <ul style="list-style-type: none"> ■ Stabilizing <p>Modalities:</p> <ul style="list-style-type: none"> ■ For pain control 	<p>Manual therapy:</p> <ul style="list-style-type: none"> ■ Cervical and thoracic mobilization or manipulation ■ Nerve mobility <p>Ther Ex:</p> <ul style="list-style-type: none"> ■ Stretching and strengthening exercises <p>Modalities:</p> <ul style="list-style-type: none"> ■ Intermittent traction combined with exercise and manual therapy <p>Education:</p> <ul style="list-style-type: none"> ■ Counseling to encourage participation in occupational and exercise activity

Assessment



Spurling Test

- SB, rotate to involved side followed by compression



Magee & Maaske Fig. 3.39

Foraminal Compression Test

- Testing purposes: be able to apply the 3-stage approach as described by Bradley and colleagues.
 1. Compression in neutral
 2. Extend neck then add compression
 3. Extend and rotate to uninvolved side, add compression, then test to involved side

'Note: Some use the classic test as shown in Fig 3.39, however the '3-staged approach is preferred and may reduce patient discomfort while providing the same valuable information



Cervical Distraction Test



Upper limb neurodynamic test 1 - Median N.

Shoulder girdle depression
Shoulder abduction to approx. 90°
Shoulder external rotation
Forearm Supination
Wrist and Finger extension, ABO the thumb

- +
- Move Elbow into extension
 - Sensitize two segments away from where symptoms are felt

For example, use neck side flexion if symptoms are felt distally



Upper limb neurodynamic test 2a - Median N. by side

*useful for patients with limited abduction

Shoulder girdle depression
Elbow extension
Lateral rotation of the whole arm
Forearm Supination

Wrist, finger and thumb extension

--+ Move limb into ABO at shoulder joint

a Sensitize two segments away from where symptoms are felt

For example, use shoulder elevation if symptoms are felt at hand or with wrist flexion if symptoms felt proximally in neck or shoulder



Upper limb neurodynamic test 2b - Radial N.

Shoulder girdle depression
Elbow extension
Medial rotation of the whole arm
Forearm Pronation

Wrist flexion and ulnar deviation, finger and thumb flexion

--+ Move limb into ABO at shoulder joint

o Sensitize two segments away from where symptoms are felt

For example, use shoulder elevation if symptoms are felt distally at thumb or neck side flexion if symptoms felt around elbow



Upper limb neurodynamic test 3 - Ulnar N.

Shoulder girdle depression
Shoulder abduction to approx. 45°
Shoulder external rotation
Pronate elbow

Wrist and Finger extension

--+ Move into Elbow flexion until symptoms are felt

--+ If full elbow flexion is available, then increase Shoulder abduction

o Sensitize two segments away

Most common to use side neck flexion



Shoulder Abduction Test

If 3 of 4 variables

$Sn=0.39$, $Sp=0.94$,
+LR= 6.10

If 4 of 4 variables

$Sn=0.24$, $Sp=0.99$,
+LR30.30

Clinical Prediction Rule for Cervical Radiculopathy

(+) Upper limb tension test (Median N. ULNT 1 or 2A)

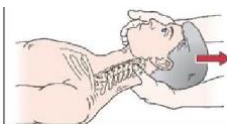
(+) Spurling's test

(+) Distraction Test

Cervical ROM < 60 degrees

Treatment:

Passive Physiological Intervertebral Movements



Traction Glide:

APPENDIX C - Participant Responses to Barrier-Related Survey Questions

<i>Survey Question 1:</i> If you chose "no" when answering: "Have you used EBP guidelines on all appropriate patients with neck pain," please state the reason(s) you did not use EBP on all appropriate patients:
"Because we used the word "all". Blanket statement" "Honestly, a week after the course I got my clinician scorecard and I found out I am exceeding treatment goals, by far, and I was told by my CD not to change a thing. I did realize though, that my current way of treating is very similar to EBP, as it was how I was taught in PT school. So by that reasoning, I guess I use EBP most of the time."
<i>Survey Question 2:</i> If you chose "no" to: "Is the amount of time that is required to use the EBP guidelines reasonable," what do you believe is the barrier to having enough time to use EBP on all appropriate patients with neck pain?
"High caseload"
<i>Survey Question 3:</i> If you chose "sometimes" or "never" to: "In the past two months how often did you use the biofeedback cuff for cervical endurance assessment and treatment," what do you feel is the barrier to using the biofeedback cuff more frequently?
"More patients that fit into category"
"We have so many patients in the clinic at one time. If a patient is having trouble coordinating cervical musculature, it is typically more time efficient for me to come use

tactile feedback rather than having the biofeedback cuff set up. It requires us to teach the rehab techs and all other support staff as well. Honestly, it feels like it is more of an imposition. I think it would be a great tool if I could do one on one treatments for everyone, so that I would also have time to tell them that it is not a piece of equipment that they need to go out and purchase, it is simply for muscle activation.”
“Time”
“Haven’t used it enough to consider an essential tool in my toolbox”
“Some patients have significant difficulty lying supine or changing positions”
“Not appropriate”
“Time”
<i>Survey Question 4:</i> If you chose "no" to: "Have you maintained the use of the recommended EBP's you were taught six months ago," please state the reason you stopped using the recommended guidelines or if you never used them at all.
“Best practice”
“Honestly, this is the way that I was taught in PT school, so it came naturally to practice this way. The course was a good reminder of some of the things I had either forgotten or had strayed from.”
“Red dot and Chin tuck pump”

"Good outcomes"
"Improved patient progress"
"subjective improvements"
<i>*Survey Question 5: If you chose "sometimes" or "never" to: In the past two months, how often did you use the laser headlamp for patients where it was appropriate," what do you feel is the barrier to using the laser headlamp more frequently?</i>
<i>*Survey Questions 6: If you chose "sometimes" or "never" to: "In the past two months, how often did you use cervical joint MOBILIZATION on appropriate patients with neck mobility deficits," what do you feel is the barrier to you performing this treatment with your patients where it is indicated?</i>
<i>*Survey Questions 7: If you chose "sometimes" or "never" to: "In the past two months, how often did you use cervical joint MANIPULATION on appropriate patients with neck mobility deficits," what do you feel is the barrier to you performing this treatment with your patients where it is indicated?</i>

*After all the data was received at the end of the six-month timeframe, it was revealed that the last three questions were not displayed to the therapists due to technological issues.

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CURRICULUM VITAE

Kristine David, PT, DPT

Las Vegas, NV

Email: David.kristinec@gmail.com

Education

- Doctorate of Physical Therapy, University of Nevada, Las Vegas, 2021-2024
- B.S. Kinesiology, Exercise Science, Cum Laude, California State University, Long Beach, 2015-2018

Certifications

- OTAGO Exercise Program: Falls Prevention Training Certification, October 2022
- STEADI: Empowering Healthcare Providers to Reduce Fall Risk Training Certification, September 2022

Associated Experience

- SPT at VA Medical Center, January 2024-April 2024 (Acute Care)
 - Evaluated, treated, and provided discharge recommendations for acute patients of the veteran population. Collaborated with the entire healthcare team to maximize patient function, improve strength and endurance, and prevent many complications of prolonged bedrest and immobility.
- SPT at Sunrise Hospital and Medical Center, September 2023-December 2023 (Inpatient Rehabilitation, Underserved)
 - Evaluated and treated patients of all ages and diagnoses as a student inpatient rehabilitation therapist for an underserved population at a Level II Trauma Center. Collaborated closely with an interdisciplinary team of nurses, doctors, therapists and other medical personnel to discuss discharge recommendations, family training and achievement of patient/team goals.
- SPT at UFC Performance Institute, July 2023-September 2023 (Outpatient Sports Specialty)
 - Evaluated and treated professional mixed martial arts athletes. Collaborated closely with an interdisciplinary team of top professionals in their respective fields of strength and conditioning coaches, athletic trainers, sport science practitioners, and nutritionists in order to optimize performance through injury prevention and rehabilitation.
- SPT at Elam Sports O'ahu, June 2022-July 2022 (Orthopedic Outpatient, Industrial)

- Assessed patients of various orthopedic diagnoses. Consistently incorporated evidence-based practice to guide treatments and followed post-op protocols accordingly. Utilized aquatic therapy as indicated for appropriate cases.
- Physical Therapy Aide at Movement Works Physical Therapy, May 2018-December 2018 (300 hours - Orthopedic Outpatient)
 - Monitored patients' performance and anticipated the next chart element. Instructed and corrected for optimal form. Answered phones, managed payments and handled scheduling. Shadowed licensed physical therapists through asking questions and keen observations.
- Physical Therapy Aide Volunteer at VA Hospital, Long Beach, August 2016-December 2016 (Spinal Cord Injury Division)
 - Checked in and prepped patients for their appointments. Executed physical therapists' requests. Maintained sanitary conditions. Transported patients. Ordered supplies. Assisted in a wheelchair clinic.

Additional Employment History

- Personal Trainer at UFC Gym Honolulu, October 2019-May 2021
 - Led, instructed and motivated individuals or groups in exercise activities, for people of all ages and skill levels. Demonstrated and assessed proper performance of various exercises and routines to minimize injuries and improve quality of life. Monitored clients' progress and adapted programs as needed. Prospected potential clients and consistently met sales goals.
- Sports Training and Research (STAR) Internship at CSULB, January 2018-December 2018
 - Worked closely with professors, clinicians, athletes, and other interns in an effort to optimize athletic performance. Collaborated with biomechanists and coaches to aid in practice design and conduct evidence-based movement training programs. Assisted in data collection and analyses.

Graduate Research Project

- David K, Kaderka S, Villarias C, Barrett T, Clow D, Lutz A. Implementation of Evidence-Based Practices to Improve Treatment for Patients with Neck Pain: A Pilot Study. May 2024

Membership in Professional Organizations

- Member American Physical Therapy Association(APTA) (2021- present)
 - Nevada Physical Therapy Association (2021-present)
 - Hawaii Physical Therapy Association (2022-present)
 - Sports Section (2022-present)

- SIGs: College & Professional Sports, Performance Enhancement, Sports Concussion, Tactical Athlete

Honors and Awards

- 2023 UNLV DPT Scholarship Recipient
- 2016 and 2017 CSULB Dean's List

Community Service

- Muay Thai Tournament Medical Team Assistance (2/24/24) 6 hours
- Rock Steady Boxing (9/9/22 -12/1/23) 15 hours
- Wheelchair Rugby Tournament (11/19/22) 5 hours
- Bishop Gorman High School Baseline Concussion Testing (11/16/22) 3 hours
- NV Senior Games (10/8/22) 4 hours
- Dignity Health ATC Shadow (9/29/22) 5 hours
- Balance and Memory Screening (9/23/22) 4 hours
- Wheelchair Basketball Tournament (2/13/22) 4 hours

Leadership

- Qualities/Roles/Positions:
 - UNLVPT Class of 2021 – Social Officer (10/21/2021-5/10/2024)
 - I help to organize social events for the class to promote overall cohesiveness and encourage a positive work environment. We also put together three events to lend our time for the PT Day of Service.
 - UNLVPT Sports Med Club – Director of Finance (2022), Vice President (2023)
 - I help organizing guest speakers throughout the semester, set up biweekly meetings, and moderate student questions.
- Leadership skill development pathways:
 - Attended APTA Academy of Sports Physical Therapy Tactical SIG discussing “Musculoskeletal Injuries in Military Tactical Athletes” (11/16/22)
 - Attended NSCA 2022 Nevada State Clinic (11/12/22)
 - Peer mentor (Pre-PT) Student interviews volunteer/mingler (11/5/2022)
 - Attended APTA Academy of Sports Physical Therapy Tactical SIG discussing “Wellness Strategy for Tactical Athletes” (10/13/22)
 - Attended APTA NV Annual Conference including educational track by Dustin Clow PT, DPT “Exercise Intolerance and Exertion Training in Concussion” (10/1/22)
 - Attended APTA Academy of Sports Physical Therapy Journal Club discussing “Clinical Implications for Athletes with an ACL injury” (9/28/22)

- Professionalism Module 1: Introduction to Professionalism (9/28/2022) – APTA Learning Center
- Professionalism Module 2: History of Professionalism in Physical Therapy (9/28/2022) – APTA Learning Center
- Professionalism Module 3: Ethical Compass (9/28/2022) - APTA Learning Center
- Attended APTA NV SSIG Speaker Series – featured speaker was Yonas Tekeste PT, DPT on “Travel Physical Therapy” (8/29/2022)
- Peer mentor (Pre-PT) Student interviews volunteer/mingler (1/22/2022)
- Attended NSCA 2021 Nevada State Clinic (11/20/21)

Continuing Education

- UNLVPT Brown Bag Lecture Series:
 - 9/2/22: Kate Addis, PT, DPT “Non-clinical roles for a physical therapist: what these look like, how to find them, etc.”
 - 4/22/22: Tyler Billings, PT, DPT & Spencer Townsend PT, DPT “Developing your Clinical Leadership Toolkit and Real-World Strategies to put the Quadruple Aim into Practice”
 - 4/1/22: “DEI Brown Bag Discussion: Interrupting Microaggressions”
 - 3/3/22: Nicole Piemonte, PhD “Cultivating the Habits at the Heart of Patient Care: Compassion, Vulnerability, and Imagination”
 - 2/9/22: Merrill Landers, PT, DPT, PhD “Becoming a faculty member: pathways, tips, and strategies.”
 - 11/5/21: Logan Ponce, PT, DPT, CSCS “How Physical Therapy contributes to Performing Arts Medicine”
 - 10/6/21: Charlene Portee, PT, PhD, FAAPT “The Road to Success: Are We Ready to Change Direction?”
 - 9/10/21: Danielle Parker, PT, DPT, GCS, CEEAA “iPT: There’s an App for that? Enhancing your practice and learning through mHealth technology.”
- UNLVPT Sports Med Club
 - 11/29/22: Patrick Berner “More than Movement: The Role of Nutrition in Physical Therapy Practice”
 - 11/1/22: Bernard Condevaux “It’s the Hard Wood Life: Working in Professional Basketball”
 - 10/25/22: Chris Hughen “Treating Powerlifters”
 - 9/27/22: Erik Meira “Critically Reading and Appraising Research”
 - 9/20/22: Chris Lefever and Haley Anderson “Treating Olympians: Perspectives from Both Ends of the Pool”
 - 9/13/22: Rick Joreitz “D1 Football, Basketball, and Academia”

- 9/6/22: Kyle Moore, "The Unique Needs of Hockey Athletes"
- 4/11/22: Ash Campbell "Golf and Cash PT"
- 4/4/22: Tiffany Barrett "Evaluating Runners"
- 3/28/22: Sofia Cruz & Scott Pensivy "Cash PT"
- 3/24/22: Keoni Kins "Taping Lab"
- 1/24/22: Liz Wellsandt "Psychological Aspects of Return to Sport and Shared Decisions Making"
- 11/16/21: Bergen Shah "Cash PT"
- 11/1/21: Eric Avila "Event coverage"
- 10/5/21: Major Heiner "Military Physical Therapy"

Sarah Kaderka, PT, DPT
University of Nevada, Las Vegas
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Education

DPT	University of Nevada, Las Vegas	2024	Physical Therapy
BS	University of Nevada, Reno	2021	Biomedical Engineering

Certifications

- Basic Life Support – CPR and AED (exp April 2026)
- The Otago Exercise Program: Falls Prevention Training (Fall 2022)
- Stopping Elderly Accidents, Deaths, & Injuries / STEADI (September 9, 2022)

Associated Experience

Jan 2024 – Mar 2024	Advanced Spine and Posture <ul style="list-style-type: none">• Outpatient orthopedic clinical rotation, performing 75-100% of full patient caseload• Treating patients 13-80 with orthopedic conditions
Oct 2023 – Dec 2023	Providence St. Elias Speciality Hospital <ul style="list-style-type: none">• Inpatient rehabilitation clinical rotation, performing 50-75% of full patient caseload• Treating patients with complex neurological conditions
April 2023 – June 2023	Scorebuilders <ul style="list-style-type: none">• Assisted with the creation of the 2024 revision of <i>PTEXAM: The Complete Study Guide</i>
Jul 2023 – Aug 2023	Spring Valley Hospital Medical Center <ul style="list-style-type: none">• Performing ~50% of full patient caseload in an acute hospital setting• Treating patients with neurological and orthopedic conditions
Jun 2022 – Jul 2022	Carson Tahoe Therapy <ul style="list-style-type: none">• Outpatient orthopedic clinical rotation, performing ~25% of full patient caseload

- Presented the Theory of Optimal Learning to promote continuing education
 - Observed THA and trigger finger replacement surgeries
 - Observed a Total Joint Preparation class given to current patients
- Aug 2020 – Apr 2021 **Custom Physical Therapy**
- Educated patients on performing specific rehabilitation exercises
 - Maintained efficiency of a fast-paced patient intake flow into the clinic
- Aug 2018 – Feb 2019 **Hanger Clinic**
- Gained ample knowledge of orthotics/prosthetics including product manufacturing and patient care
- Jul 2017 – Feb 2018 **Todd's Body Shop Physical Therapy**
- Reviewed and updated patients' exercise programs
 - Assisted therapists with manual patient therapy and office organization

Community Service

- Rock Steady Boxing (*April 2023*); 2 hours
 - Helped with patient safety and assisted coaching patients through exercises
- Wheelchair Rugby Western Semifinals (*March 2023*); 4 hours
 - Kept track of time and player penalties throughout games; set up event space.
- UNLVPT Balance and Memory Screening (*September 2022*); 5 hours
 - Performed tests and measures on participants in the Summerlin community.
 - Helped set up and tear down the event space
- Mountain View Presbyterian Church Balance and Memory Screening (*September 2022*); 3 hours
 - Performed test and measures on members of the church
 - Educated participants in fall awareness and prevention.

Continuing Education

- Herman and Wallace: Pelvic Function Level 1 (January 2024)
 - 9 hours of pre-recorded lectures and 2-day in-person laboratory continuing education course on female pelvic floor function, dysfunction, and treatments
- The Institute of Clinical Excellence: Fitness Athlete Pregnancy and Postpartum (September-October 2023)

- 8-week online, continuing education, pelvic health course to improve understanding of changes women go through during pregnancy and postpartum and returning these patients to previous or desired levels of function
- APTA – Core Values Self-Assessment (September 2022)
 - Identified implicit bias tests to help identify areas of weakness
- APTA CSM (February 2022)
 - Attended lectures on all three days of annual conference to further my professional development

Membership

- Member of American Physical Therapy Association (2021-present) Member #: 959001
- Member of American Physical Therapy Association Nevada Chapter (2021-present)

Graduate Research Project

- David K, Kaderka S, Villarias C, Barrett T, Clow D, Lutz A. Implementation of Evidence-Based Practices to Improve Treatment for Patients with Neck Pain: A Pilot Study. May 2024

Christoffer-Judd Villarias, PT, DPT
Physical Therapist
Las Vegas, NV
ceejayvillarias@gmail.com

Education

- DPT University of Nevada Las Vegas Physical Therapy (2021-present)
- BS University of Nevada Las Vegas Kinesiology (2020)

Certifications

- Stop the Bleed – Basic Trauma Care (April 19, 2022)
- Basic Life Support (CPR and AED) – American Heart Association (valid until April 2024)
- The Otago Exercise Program: Falls Prevention Training (2022)
- Stopping Elderly Accidents, Deaths, & Injuries / STEADI (September 9, 2022)

Experiences/Employment

- Jan 2024–March 2024 Student Physical Therapist – Chicago White Sox
 - Coordinated with licensed physical therapists, athletic trainers, and strength & conditioning coaches in an outpatient professional sports setting for player development during MLB and MiLB Spring Training. Participated in organizational meetings and daily rehab meetings for player updates and planning. Performed evaluations and designed plans of care for players and staff with a large emphasis on musculoskeletal and orthopedic conditions.
- Sep 2023–Dec 2023 Student Physical Therapist – Valley Health Specialty
 - Worked with physical therapists, occupational therapists, speech therapists, and nurses in an acute rehab facility. Performed evaluations and designed plans of care for individuals with debility and patients with neurological impairments. Assessed and adjusted interventions based on patients' presentations and progress.
- Jul 2023–Sep 2023 Student Physical Therapist – Southern Hills Hospital
 - Served as rehabilitation clinician with physical therapists, occupational therapists, physicians, and nurses in the hospital setting for patients receiving acute care. Performed evaluations and designed/revised plans of care to assist in decision making for patient discharge and ability to return home. Gained clinical experience with wound care and observed orthopedic and neurological surgeries.
- Jun 2022–July 2022 Student Physical Therapist – Dignity Health

- Collaborated alongside licensed physical therapist in an underserved outpatient clinic to deliver rehabilitation to patients with a primary focus on orthopedic care related to preventative, employment, and post-surgical care. Performed evaluations and designed plans of care for new patients. Assessed and adjusted interventions based on patients' presentations and progress.
- Oct 2020–May 2021 Operations Support Specialist – ATI Physical Therapy
 - Assisted physical therapists and physical therapy assistants with patients' plan of care related to therapeutic exercise, therapeutic modalities, and wellness education. Performed essential front office duties for patient intake and communication with referring physicians.

Membership in Scientific/Professional Organizations

- American Physical Therapy Association (APTA) (2021-present)
 - Nevada Physical Therapy Association (2021-present)
 - Sports Section (2022-present)
 - Hand and Upper Extremity Section (2022-present)
 - Geriatric Section (2022-present)
- UNLV Sports Medicine Club (2022-present)

Consultative and Advisory Positions

- UNLV Class of 2024 Student Board Treasurer (2021-present)

Professional Service

- UNLV Physical Therapy Interview Day (2021, 2022, 2023)
- Fall Sports Preseason Concussion Baseline Testing – Bishop Gorman (2021)
- Research Study Participant – “Surface Discrimination in People with Lower Limb Amputation” – 2023 (Samuel Straus – straus2@unlv.nevada.edu)

Community Service

- 3rd Annual Mental Health Awareness Walkathon by Peaceful Mind Psychiatric Services – Las Vegas – (October 28th, 2023)
- Western Semifinal Wheelchair Rugby Tournament – Las Vegas (2023)
- Rock Steady Boxing (2022-2023)
- Global PT Day of Service – Wetlands Park Clean Up (October 8, 2022)
- Balance and Memory Screening (September 20, 2022)
- Shelby Estocado Annual Golf Tournament (2021, 2022)
- Student Volunteer – Mountain View Hospital – 200 hours (2018-2019)

Continuing Education

- Stop the Bleed / Basic Trauma Care, April 19, 2023 – 2 hrs
- American Physical Therapy Association Combined Sections Meeting, San Diego, CA, February 23-25, 2023 – 12 hours
- American Physical Therapy Association Combined Sections Meeting, San Antonio, TX, February 2-5, 2022 – 12 hours
- The Otago Exercise Program: Falls Prevention Training (2022)
- American Physical Therapy Association Professionalism Module 3: Ethical Compass, Webinar, Oct 9, 2022 – 3 hours
- American Physical Therapy Association Professionalism Module 2: History of Professionalism in Physical Therapy, Webinar, Oct 9, 2022 – 2 hours
- American Physical Therapy Association Professionalism Module 1: Introduction to Professionalism, Webinar, Oct 9, 2022 – 2 hours
- STEADI: Empowering Healthcare Providers to Reduce Fall Risk, Webinar, Sept 9, 2022 – 1 hour

References

- Brooks Klein, PT, DPT – (702) 683-0317
- Kassi Leseberg, PT – (307) 689-7254
- Collin Weber, PT, DPT – (702) 600-3599
- Thomas Walker, PT, DPT – (702) 439-2337