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Physical Therapy after Amputation in Community Dwelling Older Adults: A Quantitative and Qualitative Interview Study

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PHYSICAL THERAPY AFTER AMPUTATION IN COMMUNITY DWELLING OLDER ADULTS: A
QUANTITATIVE AND QUALITATIVE INTERVIEW STUDY

by

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

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Quantitative and Qualitative Interview Study

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Abstract

Purpose/Hypothesis:

To investigate participation in physical therapy in older adults after lower extremity limb loss. The secondary objective was to examine the associations between physical therapy attendance, fear of falling avoidance behavior, self-perceived prosthetic mobility, and mental well-being.

Number of Subjects:

64

Materials and Methods:

Community-dwelling older adults with amputation were recruited and individually interviewed. The data collection consisted of four surveys (Physical Therapy after Amputation Patient Perception Survey, Short-Form Health Survey [SF-36v2], Prosthetic Evaluation Questionnaire [PEQ, mobility group], and Fear of Falling Avoidance Behavior Questionnaire [FFABQ]). Participants' demographic characteristics were analyzed using descriptive statistics. Participant comments were qualitatively categorized. Pearson Correlations were used to examine the associations between perceptions of physical therapy (10-point visual analog scale), fear of falling avoidance behavior as well as mental health and wellbeing (SF-36v2 mental health subscale). Correlation analyses were also conducted to analyze the associations between participant perception of physical therapy treatment and the patient-perceived confidence in performing functional activities.

Results:

Of the 64 participants who completed the study, the mean age was 66.9 (10.7) years with 47 males and 17 females. After amputation, 79.4% of the participants received physical therapy, of them 84% expressed a

positive experience. The main reasons for the positive perceptions of physical therapy including achieving beneficial outcome and socioemotional support. The main negative comments included poor outcome, pain, socioemotional conflict, and external barriers such as difficulty in transportation and insurance. Significant positive correlations were observed between perception of physical therapy and selected prosthetic mobility items (walking on the street and shower/bathe; $p=0.04$ and 0.03 , $r= 0.432$ and 0.453 , respectively). Perception of physical therapy and FFABQ were not significantly correlated ($p=0.355$). Significant negative correlation between mental well-being score and FFABQ score were observed ($r=-0.578$, $p<0.001$).

Conclusions:

A high percentage of community-dwelling older adults received physical therapy after amputation, and most of them expressed positive experiences. Positive perception of physical therapy is related to higher confidence in walking outdoors and showering/bathing. Lower mental well-being is associated with increased fear of falling avoidance behavior.

Clinical Relevance:

While community-dwelling older adults with limb loss generally received and expressed a positive perception of physical therapy after their amputations, patient goal-directed intervention may be needed to achieve desirable outcomes and to improve selected activity function. Physical therapists should be aware of the barriers to rehabilitation after amputation and the connection between mental health issues and fear of falling avoidance behavior in this population.

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Introduction

There are approximately 2 million people in the United States living with limb loss.⁴² According to Sheehan and Gondo, it is estimated that there are between 300 and 500 amputations per day in the United States.³⁴ Among those, the main causes of amputation are dysvascular in nature, including complications from peripheral arterial disease and diabetes, which account for 54% of all amputations.⁴² The rate of diabetes-related amputations is on the rise, with a larger proportion of younger and middle-aged persons being affected.¹⁵

A significant issue faced by those living with limb loss is the lack of dedicated amputee rehabilitation programs. Moreover, there are no standardized care programs for this population. As a result, a majority of health care institutions do not provide targeted treatment for post-amputation care and many patients with limb loss are required to find rehabilitative and prosthetic treatments on their own.^{23,34}

Currently, the majority of the amputee rehabilitation research focuses on post-surgical inpatient acute care rather than outpatient care. As such, there is a lack of lifespan rehabilitative care protocols designed specifically for the maximized recovery of patients with limb loss. Similarly, current practice focuses on providing inpatient rehabilitation without continuation into outpatient therapy. Compared to other conditions, such as low back pain and stroke, limb loss has markedly fewer clinical practice guidelines. The Agency for Clinical Innovation (ACI) in New South Wales has published guidelines for minimum required care that focuses on holistic health, with a small section on physical therapy for fall prevention.⁵ In the United States, the Veteran's Association (VA) is the only group that has recently published guidelines on post-amputation care.^{7,30,39}

This apparent lack of standardized care for amputee rehabilitation is especially evident in the outpatient setting. Individuals living with limb loss often do not pursue continued rehabilitation. Zhou et al. found that the following factors contributed to discontinued care; patients of older age, those who had transfemoral or bilateral amputations, serious comorbidities, were referred from an extended care facility, or had procedures done for other pathologies after amputation were all less likely to receive outpatient

rehabilitation.⁴³ In a review of 12,599 veterans with lower limb loss, only 55% of individuals received post-amputation rehabilitative services, including physical therapy.³² Similarly, they have also found that patients over the age of 75 or who have more severe comorbidities are also less likely to receive any rehabilitation services at all.³² This is a critical issue in post-amputation care because it demonstrates that the population with the highest prevalence of amputation--for example, older adults with comorbidities including peripheral artery disease (PAD) and diabetes--are not receiving necessary post-amputation rehabilitation care.

Of those who do receive post-amputation care, many are unable to achieve their full potential level of function and continue to have enduring mobility limitations that can ultimately contribute to an increased risk for secondary health conditions. One study found that despite receiving physical therapy post-amputation, individuals with lower limb loss had impairments and limitations that persisted after completion.²⁴ Without appropriate rehabilitation, patients with lower limb amputations may experience more severe functional impairment, ranging from decreased physical activity to an increase in fall incidence.⁹ A systematic review by Hunter et al. reported that among individuals with limb loss living in the community, more than half will fall at least once each year, and of them, 33% report experiencing multiple falls, suggesting falling and the consequential fear of falling are prevalent in this population.²⁰ Falls and fear of falling, particularly among people with limb loss, are associated with decreased quality of life, social isolation, less prosthesis use, depression, limb fracture and associated health problems.¹⁷ Physical therapy can have a substantial impact on this population in helping them regain safe mobility, develop confidence in skilled prosthetic use, maintain physical function and fitness, and improve the quality of life. However, it is important for patient-reported outcomes to become regularly utilized in order to individualize physical therapy programs to the needs of this population in order to effectively serve them.

Despite the fact that improving the quality of life in patients with limb loss remains a critical component of care, this area of literature is sparse. Health care providers need to consider a valid assessment of quality of life that includes measures of patient self-reported outcomes or worsened fear of

falling. Previous studies of quality of life after limb loss indicate that quality of life improves with factors such as younger age, not using assistive devices, ability to use a prosthesis, and most importantly, higher levels of functional mobility.^{6,8,34,36} This is an important observation as physical therapy has the potential to address patient-specific needs to individualize a rehabilitation program and promote improvements in functional mobility and independence. It is critical for health care providers to consider the intrinsic and extrinsic factors that influence quality of life among individuals with limb loss.

The purpose of this study was to investigate participation in and perceptions of physical therapy in older adults after lower extremity limb loss. The secondary objective was to examine the associations between physical therapy attendance and perception, fear of falling avoidance behavior, self-perceived prosthetic mobility, and mental well-being. The results of this study can be applied to improve the efficacy of participation and patient satisfaction in physical therapy rehabilitation with the intended goal of reducing fall risk, fear of falling, and improving the quality of life in individuals with limb loss.

Methods

Recruitment Procedures

The current research is a cross-sectional interview study targeting community dwelling older adults with lower limb amputation. Our study was approved by the IRB for Biomedical Research at UNLV. Participants with lower extremity (LE) amputation were recruited from prosthetics & orthotics clinics and rehabilitation facilities in the Southern Nevada region (i.e., Hanger Clinic Prosthetics and Orthotics, Nevada Orthotics & Prosthetics, Prosthetic Center of Excellence, Precision Orthotics and Prosthetics, and Encompass Health Rehabilitation facilities), and an amputee patient support group (Las Vegas Amputee Support Group). The data collection consisted of four surveys. A researcher personally interviewed each participant. Data were collected between Fall 2018 and Spring of 2019. Inclusion criteria for this study was age over 18 and have experienced unilateral or bilateral lower limb loss. Exclusion criteria was the inability to understand and answer simple survey questions in plain English.

Survey Procedure

After obtaining informed consent, participants were asked to fill out a series of three written surveys and one electronic survey. These surveys included: Physical Therapy after Amputation Patient Perception Survey (Appendix), Short-Form Health Survey [SF-36], The Physical Mobility portion (specifically, group 4) of the Prosthetic Evaluation Questionnaire [PEQ-MS], and Fear of Falling Avoidance Behavior Questionnaire [FFABQ]. The Physical Therapy Perception Survey is an electronic survey that consists of 40 questions. It contains both open-ended and closed-ended questions that inquire about the participant's level and side of amputation(s), types and volume of care received for amputation, current functional status, fall history in the last 12 months, perception of physical therapy, and general information and comments about physical therapy received after amputation. The survey takes approximately 10 minutes to complete. The Physical Therapy Patient Perceptions Survey has been evaluated for face validity based on inputs of experts in physical therapy and prosthetics. The SF-36 has been used in other studies to help compare subjects with and without various disabilities, including

amputations.¹⁸ It has good reliability and construct validity (Cronbach's alpha > 0.85, reliability coefficient > 0.75).² The FFABQ is reliable and valid (95% CI = 0.706-0.883) for assessing avoidance behavior due to fear of falling by community ambulators with mild or no cognitive deficit.²² The PEQ-MS also has high reliability, construct validity, and internal consistency (person-separation reliability = 0.95, item-separation reliability = 0.98).¹²

Statistical Analysis

Participant demographic characteristics were analyzed with descriptive statistics. Pearson correlation was used to investigate the relationship between physical therapy participation and 12-month fall incidence. An independent *t*-test was used to compare PEQ-MS scores in participants who did and did not receive physical therapy after amputation. Pearson correlations were also used to compare perception of physical therapy (using a 10-point visual analog scale) with 12-month fall incidence. Pearson correlations were also used to analyze the relationship between participant perception of physical therapy and PEQ-MS. Pearson correlations were also used to examine the relationships between perceptions of physical therapy by individuals with amputations and fear of falling and avoidance as well as mental health (as captured by the SF-36 mental health subscale), along with the relationship between fear of falling avoidance behavior and mental health. Fisher's Exact test was used to determine the presence of an association between socioeconomic status and participation in physical therapy.

Participant's positive perceptions were categorized into two main domains, and participant's negative perceptions were categorized into 4 main domains. Positive perceptions were broken down into Outcome/Benefits if participants expressed physical therapy helped them become more mobile, decreased pain, or felt the interventions, education and exercises were useful. Those in the Socioemotional Support group were placed in this category from responses such as liking their physical therapist, being able to socialize with others at their appointment, and experiencing consistent treatments from the same therapist.

Negative perceptions were broken down into Outcome/Benefits if they did not enjoy the exercises or stretches, experienced an injury during treatment, or felt PT was overall not helpful. Participants were

placed in the Pain category if they described treatments as painful. Those in the Socioemotional Conflict category did not like physical therapy due to lack of consistency, working with multiple different therapists, or an overall dislike of the therapist. The participants placed in the External Factors group shared responses such as inconvenience of location of clinic or improper fit of the prosthetic.

Table 1: Participant Demographics

	Mean (SD) n=64*
Age (years)	66.9 (10.7)
Height (cm)	172.1 (9.7)
Weight (kg)	84.5 (20.4)
Sex	Frequency (Percent)
Female	17 (26.6)
Male	47 (73.4)
Ethnicity	
Caucasian	35 (54.7)
African American	13 (20.3)
Hispanic/Latino	8 (12.5)
Native American	1 (1.6)
Pacific Islander	1 (1.6)
BMI (per reported height and weight)	
<18.5	2 (3.1)
18.5-25	18 (28.1)
25-30	19 (29.7)
> 30	24 (37.5)

*Not all 64 participants answered each question, therefore some categories have fewer than 64 responses.

Table 2: Participant and Amputation Characteristics

Level of Amputation	Frequency (Percent) N = 64*
Above knee	21 (32)
Below knee	37 (57.8)
Hip Disarticulation	1 (1.6)
Time After Amputation	
<1 year	6 (9.4)
1-5 years	17 (26.6)
6-10 years	12 (18.8)
> 10 years	27 (42.4)
Side of Amputation	
Left	29 (45.3)
Right	27 (42.2)
Bilateral	7 (10.9)
Reason for Amputation	
Vascular	24 (37.5)
Non-Vascular	35 (54.7)
Received Physical Therapy_±	
Yes	50 (78.1)
No	13 (20.3)
Perception of Physical Therapy_°	
Positive	42(65.6)
Negative	8 (12.5)

Incidence of Falls in the Last 12 Months [⊖]	
0 Falls	18 (34.0)
1 Fall	13 (24.5)
2-5 Falls	15 (28.3)
5-10 Falls	2 (3.8)
More than 10 Falls	5 (9.4)

*Not all 64 participants answered each question, therefore some categories have fewer than 64 responses.

+Based on responses to the yes/no question “Have you received Physical Therapy after your amputation?” in the *Physical Therapy after Amputation Patient Perception Survey*.

o Based on responses to the VAS question “On a scale from 0 to 10, do you feel you had positive outcomes from Physical Therapy? (0-Not at all, 10-Extremely positive)” in the *Physical Therapy after Amputation Patient Perception Survey*. Responses from 0-4 were considered negative, and responses from 5-10 were considered positive.

⊖ Based on responses to the multiple-choice question “How many times have you fallen in the last 12 months?” in the *Physical Therapy after Amputation Patient Perception Survey*.

Results

Physical Therapy (Participation & Perception) and Fall Incidence

Of the 64 participants, 50 of them reported having received physical therapy after their amputations, and 13 reported not having received physical therapy (1 participant did not answer). There was no significant correlation ($p = .393$) of individuals who received physical therapy with those who did not. We found no relationship between participant perception of physical therapy and incidence of falls in the last 12 months ($p=0.469$).

Physical Therapy (Participation & Perception) vs. Self-Reported Mobility

Significant positive correlations were found between participant perception of physical therapy and PEQ-MS, items G and M, which rate ability to walk on the sidewalk and street and ability to safely shower and/or bathe ($p=0.040$ and 0.030 , $r=0.432$ and 0.453 respectively). There was no significant relationship found between PEQ-MS total score and whether or not participants received physical therapy services ($p=0.456$).

Perception of Physical Therapy, Fear of Falling, and Mental Wellbeing

There was a statistically significant negative correlation between the total score in the mental health category of the SF-36 and the FFABQ score ($r=-0.578$, $p<0.001$). There was not a statistically significant correlation between the FFABQ score and the patient's perceptions of physical therapy (Q29) ($p=0.355$). There was not a statistically significant correlation between patient perceptions of physical therapy and mental wellbeing ($p=0.091$).

Socioeconomic Status and Physical Therapy Participation

When comparing those who identified as having financial difficulty versus those who did not, those who reported having financial difficulty were marginally more likely to receive physical therapy after amputation (Fisher's exact test, $p=0.036$).

Participants' Reasoning for Physical Therapy Perception

Table 3 illustrates the results of participant responses when asked what aspects of the physical therapy experience, they found positive and negative. The total of responses is 59 instead of 100 due to participants that did not provide reasons for both positive and negative experiences, and answers that could not be quantified or were recognizable such as "nothing" or "Biance."

Table 3: Positive and Negative Aspects of Physical Therapy

<u>Positive</u>	Frequency (Percent)
Outcome/Benefits	29 (70.7)
Socioemotional Support	10 (24.4)
<u>Negative</u>	
Outcome/Benefits	9 (22.0)
External Factors	5 (12.2)
Socioemotional Conflict	4 (9.8)
Pain	2 (4.9)

Discussion

Among our participants, 79.4% reported receiving some type of physical therapy treatment after limb loss, and of those, 84% reported a positive perception of their experience. We further found that fear of falling avoidance behavior was negatively correlated with mental wellbeing in this population, suggesting that diminished mental wellbeing (i.e. feeling more down and depressed) is related to increased fear of falling and avoidance behaviors in individuals with amputations. Bjerk et al. found that fear of falling is significantly related to health-related quality of life in older adults.⁴ These findings underline the importance of recognizing and addressing mental wellbeing and fear of falling in individuals with limb loss in order to comprehensively improve quality of life.

The importance of including mental well-being in assessment is illustrated by Hunter et al. who found that of individuals who experienced a fall, 73% reported psychological problems associated with the fall experience.²⁰ Additionally, after data analysis of 435 individuals, they found that 52.4% had fallen in the last year and of those, 55% reported fear of falling.²⁰ However, it is important to note that although we did not find any correlation between perceptions of physical therapy and decreasing one's fears of falling, generally, rehabilitation after limb loss improves mobility-related quality of life ratings, which may have an indirect relation to their fear of falling.^{2,33} Physical therapy has been shown to improve the mental health of those participating through the application of a supportive environment which applies biological and psychosocial aspects to promote integration of physical and mental wellbeing.²⁹ The psychotherapeutic-related approach in physical therapy utilizes movement as a gateway to enhance a patient's social-affective functioning and is an important adjunct to the overall wellbeing of patients.²⁹ Of the participants that had a positive perception of physical therapy, 24.4% attributed this to positive socio-emotional support, while 70.7% cite functional outcomes as the greatest contributor to positive perception. Therefore, physical therapy can indirectly address mental wellbeing, as well as improve functional mobility and potentially fear of falling for older adults with lower limb amputations. Kendrick et al. showed that exercise interventions are likely to reduce fear of falling in community-dwelling older

adults immediately after the interventions without increasing the risk or frequency of falls, though further studies are needed to determine if this extends beyond the initial training period.²¹

In a positive therapeutic alliance, the patient and healthcare worker have mutual trust, empathy, affective bond, agreement of goals, and a collaborative relationship. A good therapeutic alliance has been shown to increase patient compliance to rehabilitation programs, improve symptoms, and enhance recovery.²⁸ Communication is a key factor when building a relationship with patients. Pinto et al found that involving patients, facilitating, and supporting conversations (asking open-ended questions, discussing patient options, explaining important details to a patient) all had a high correlation with a positive therapeutic alliance.²⁸ Of those who had a positive perception of physical therapy, 10 out of 39 (25.6%) reported it was due to good socioemotional support associated with physical therapy. Some examples of this included: having an empathetic therapist, knowledge gained from the therapist, enjoyment of communicating, and having the same therapist for each treatment session. On the other hand, of those who had a negative perception of physical therapy, 5 out of 20 (20%) reported it was due to a socioemotional conflict. Examples of this included: not liking the physical therapist, having a different therapist at each visit and having a difficult therapist to work with.

Additionally, we found that 29 out of 39 (74.4%) participants who expressed a positive perception regarding physical therapy did so due to the perceived positive outcomes and benefits. Examples of this included: accomplishing mobility goals, overall strength gains, stretching of the residual limb, and manual therapy to improve pain and comfort. However, one could argue that a good therapeutic relationship must be established based on the virtuous cycle of positive treatment outcomes. For example, of those with a negative perception of physical therapy, 9 out of 20 (45%) reported it was due to the lack of outcomes or benefits from physical therapy. Some responses included: the participant felt they could do the treatment on their own, the physical therapist only had the participants walk, and one participant said there was no new or informative information. In order for a patient to perceive physical therapy as helpful, it is crucial that the therapist incorporates a progressive treatment and has open communication with each patient. It is possible that because of the older age of our participants, some physical therapists

were not incorporating challenging enough activities throughout treatment sessions. Furthermore, most of our participants received physical therapy more than 10 years ago. It is possible many practicing therapists lack the necessary education and training to effectively treat this unique population. Research in interventions and treatments are continually evolving and one must take specific continuing education courses to better serve patients with limb loss.

We found that 79.4% of our participants did receive physical therapy after amputation; however, adherence to the treatment or the continuation of therapeutic exercise and physical activities post-discharge from physical therapy may be more important for maintaining function in this population. A systematic review by Picorelli et al. showed older adults who were committed to a structured exercise program had a decreased number of falls, improved balance, and increased muscle strength.²⁷ One barrier found to adhering to an exercise program was reduced mental wellbeing, specifically those who suffer from or are at-risk of depression, not physical capacity.²⁷ Additionally, older individuals who had confidence in their own ability to do exercises correctly were more likely to adhere to rehabilitation.²⁷

Rehabilitation improves outcomes for individuals with limb loss, as shown by previous research stating that inpatient rehabilitation improves patients' function 6 and 12 months after amputation.^{6,7,10} However, the studies with these findings focused on mortality and medical stability rather than physical function and participants' perceived quality of life.^{10,37}

In a recent study by Gailey et al., the concept of Evidence Based Amputee Rehabilitation (EBAR) was explored in order to determine whether or not older adults with limb loss may benefit from continued specific interventions aimed at improving mobility.¹⁴ It was found that 75% of participants who completed EBAR (over an 8-week intervention period) demonstrated greater improvement than the minimal clinically important difference on the Amputee Mobility Predictor with prosthesis. Interestingly enough, the study included participants who have already engaged in either physical therapy, prosthetic training, or both prior to the study. This study suggests that people with lower limb loss should return to physical therapy regularly to participate in EBAR throughout their lifetime in order to maintain optimal physical function.

Future research is needed to address these effects and may be beneficial in further analyzing the perceptions that these individuals have. Our research shows that mobility for this population was not affected by whether the person with limb loss received physical therapy or not. This could potentially be related to the lack of guidance physical therapists have through clinical practice guidelines (CPG) on treatments specific to improving mobility in the limb loss population. For example; the British Association of Chartered Physiotherapists in Amputee Rehabilitation (BACPAR) have published a CPG that encompasses short and long term care, however this guide remains vague, with a majority of its recommendations acting as blanket statements of rehabilitation such as “[the] rehabilitation programmes should include education on falls.”³ Outside of recommending to increase knowledge of prosthetics and biomechanical changes after amputation, the BACPAR CPG is ambiguous enough that it can be generalized to many other conditions requiring rehabilitation. This makes it difficult for physical therapists that are unfamiliar with treating an individual with limb loss to utilize this CPG.

Current limitations in the healthcare system that can bar older amputee patients from the rehabilitative care they need include poor continuity of care and lack of communication between providers. Of all participants in our study only 15.5% received both inpatient and outpatient physical therapy after amputation. Therefore, there is a large majority of patients who are not exposed to the benefits of physical therapy after amputation. While there may be individuals living with limb loss who may not need physical therapy services, those who also live with dysvascular comorbidities such as PAD or diabetes may benefit from such to address changes in somatosensation and decreased balance ability.³¹ Furthermore, as a person with limb loss ages, physical therapy may also prolong independent functioning and improve quality of life.

Characteristics of people with limb loss that are less likely to receive continued physical therapy include: lower level of education, being a smoker, lack of obtaining private health insurance, having a serious muscle injury, and having a lower fitness level at time of amputation.¹⁹ The current role of outpatient amputee rehabilitation may be to examine gradual changes in residual limb volume and to provide consultation and care when conditions secondary to amputation arise.^{13,40} This may be related to

the fact that patients have a lack of access to rehabilitative care. The prescription of rehabilitative care for patients post amputation surgery is inconsistent among hospitals with the majority of patients not receiving inpatient services and instead being discharged directly to home without care.¹¹

However, despite the lack of appropriate and consistent protocol for health care for individuals with limb loss, there is promising research that suggests a home education and exercise program may be one way to combat the adverse health outcomes this population is at risk for. Godlwana et al. found that through pictorial education aimed at educating individuals on contracture prevention, safe transferring techniques and regular stretching, in addition to encouragement of daily and specific balance and exercise performance have the potential to improve mobility, activity levels, participation levels and quality of life in people rehabilitating from limb loss.¹⁶ The study also made an effort to include simplified, picture-based instructions to limit the barriers presented by language and educational differences, making the results of this study promising for individuals of various backgrounds, as limb loss can affect any population. A guided home exercise and education program for these patients may be a good first step in providing this

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- Integrated Health Care Delivery System. *Archives of Physical Medicine and Rehabilitation*. 2008; 89(10):1863-1872. doi:10.1016/j.apmr.2008.03.013
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Appendix

Physical Therapy after Amputation Perception Survey

1. What is your level of amputation?

Above the knee

Below the knee

Others (please specify)

2. What is the side of amputation?

Left

Right

Both

3. Have you fallen before?

Yes

No

Condition: No Is Selected. Skip To: What assistive device do you use?

4. How many times in the last 12 months?

Once

Between two to five times

Between five to ten times

Over ten times

5. Please describe your fall(s). (Please select all that apply)

After amputation, before receiving my prosthetic

After receiving my prosthetic

With my prosthetic on

With my prosthetic off

6. What assistive device do you usually use (use at least once a day)?

Cane

Walker

Wheelchair

Other

None

7. How long after surgery did you receive your prosthesis?

- Within 2 months
- Between 2-3 months
- Between 3-4 months
- Between 4-5 months
- Between 5-6 months
- After 6 months

8. Have you had any difficulty with balance when walking with your prosthesis during the last 4 weeks?

- Yes
- No

9. Do you feel fatigued when walking with your prosthesis?

- Yes (usually after how long?)
- No

10. From a scale of 0 to 10, how safe do you feel when walking with your prosthesis?

11. Did you receive any training (walking, putting it on/removing) for your prosthesis? (0-Not safe, 10-Safe)

- Yes
- No

Condition: No Is Selected. Skip To: What have you done that you feel is beneficial?

12. Who provided you the training?

- Prosthetist
- Physical therapist
- Occupational therapist
- Nurse
- Medical doctor
- Friend/family
- Other amputees
- Other

13. What have you done that you feel has benefited you in your recovery and using your prosthesis?

- Immediate and early fitting of prosthetic
- Exercised regularly
- Compression therapy
- Training how to use prosthetic
- Other _____

14. From a scale of 0 to 10, how satisfied are you currently with your mobility? (0-Dissatisfied, 10-Satisfied)

15. Have you received Physical Therapy after your amputation?

Yes

No

Condition: No Is Selected. Skip To: If you didn't receive Physical Therapy....

16. Who referred you to Physical Therapy?

Medical doctor

Prosthetist

Friend/family

Other

17. Did you have Physical Therapy after surgery before receiving your prosthesis?

Yes

No

18. Did you have Physical Therapy after receiving your prosthesis?

Yes

No

19. Did you have Physical Therapy before the amputation?

Yes

No

20. Where did you receive Physical Therapy after your amputation? (Please select all that apply)

Inpatient Rehabilitation (3 hours of therapy per day)

Skilled Nursing Facility (similar to nursing home)

Home Therapy

Outpatient (Travel to a clinic from your home)

Other: _____

21. How often did you receive treatment?

Three times a week

Twice a week

Once a week

Twice a month

Once a month

Other: _____

22. How long were the treatment sessions?

30 minutes

60 minutes

90 minutes

Other: _____

23. How long did you go to Physical Therapy?

Less than one month

Less than six months

Less than one year

Greater than one year

24. Did you see mostly the same Physical Therapist each session?

Yes

No

25. If not, who did you see?

Different Physical Therapists

Physical Therapist Assistant

Physical Therapy Tech

26. What therapeutic interventions did you receive? (Please select all that apply)

Electrostimulation (TENS)

Ultrasound

Massage

Stretching

Exercises

Walking training

Balance training

Transfer training

Safe falling techniques

Heat

Ice

27. What did you like about the Physical Therapy you received?

28. What did you not like about the Physical Therapy you received?

29. On a scale from 0 to 10, do you feel you had positive outcomes from Physical Therapy? (0-Not at all, 10-Extremely positive)

30. If you didn't receive Physical Therapy, what were your reasons?

The following questions are related to your health

31. Have you been diagnosed with arthritis?

- Yes
- No

Condition: No Is Selected. Skip To: Have you been diagnosed with diabetes?

32. Where have you been diagnosed with arthritis? (Please select all that apply)

- Fingers
- Hips
- Knees
- Feet
- Other _____

33. Are you currently taking medication for your arthritis?

- Yes
- No

34. Have you been diagnosed with diabetes?

- Yes
- No

Condition: No Is Selected. Skip To: Have you been diagnosed with any hear....

35. Do you have Type I or Type II diabetes? (Type I: body can't produce insulin, usually happens earlier in life. Type II: Body is resistant to insulin.)

- Type I
- Type II
- Don't know

36. Are you currently taking medication for your diabetes?

- Yes
- No

37. Have you been told by any health professional that you have cataracts, glaucoma, or macular degeneration?

- Yes
- No

38. Are you currently wearing corrective eye lenses?

- Yes
- No

39. Do you normally wear corrective lenses?

Yes

No

40. When was the last time you went to your eye doctor?

Within the last month

Within the last 6 months

Within the last year

Over a year ago

41. Please enter your Subject ID

Curriculum Vitae

Amanda Ferraro

Email: Aferraro17@gmail.com

Education

DPT	University of Nevada, Las Vegas – Las Vegas, Nevada	2017-2020	Physical Therapy
BS	University of Nevada, Reno – Reno, NV	2010-2015	Community Health Sciences

Clinical Experience

January – March 2020	Student Physical Therapist – Select Physical Therapy – 750 Coronado Center Drive #140, Henderson, Nevada 89502 <i>Outpatient Orthopedic, Sports, Vestibular and Concussion Rehab</i>
October – December 2019	Student Physical Therapist – Northern Nevada Medical Center – 2375 E. Prater Way, Sparks, Nevada 89434 <i>Inpatient Rehabilitation, Acute Care and ICU</i>
July – September 2019	Student Physical Therapist – Rehab & Industrial Services of Nevada- Winnemucca – 325 Hanson St, Winnemucca, Nevada 89445 <i>Outpatient Orthopedic, Inpatient Skilled Nursing Facility and Acute Care</i>
June – August 2018	Student Physical Therapist – NewSport Physical Therapy – 2711 E. Coast Hwy. Suite 206, Corona Del Mar, California 92625 <i>Outpatient Orthopedics</i>

Work Experience

Aug – Dec 2018	Graduate Assistant – Department of Physical Therapy, School of Allied Health Sciences, University of Nevada, Las Vegas
Jan – June 2019	Research Assistant – Department of Physical Therapy, School of Allied Health Sciences, University of Nevada, Las Vegas

Research Interest and Experience

Co-Investigator: Kubo M, Horn L, Gorton J, Ferraro A, Shih H, Macleod T, Lee S. Physical Therapy After Amputation in Community Dwelling Older Adults: A Quantitative and Qualitative Interview Study, *Writing/Revision stage* (Research mentor: Dr. Szu-Ping Lee)

To investigate the utilization of and satisfaction with physical therapy in older adults after lower extremity limb loss

Leadership and Service

March 11, 2020	Volunteer – Stepping on Program
February 8, 2019	Volunteer – 2019 Student Interview Day
February 1, 2019	Volunteer – 2019 Student Interview Day
October 20, 2018	Volunteer at Parkinson’s Moving Day Las Vegas
August 11, 2018	Volunteer at Las Vegas Heart Walk
July 28, 2018	Mentor for at-risk children – P.S. I love you Foundation
April 28, 2018	Volunteer at Amputee Mobility Clinic
January 19, 2018	Volunteer – 2018 Student Interview Day

Professional Growth and Continuing Education

Current Concepts in Movement Assessment Certification

February 23-24, 2020 AMI certified

American Physical Therapy Association Combined Sections Meeting, Denver CO, Feb 12-15, 2020

February 13, 2020	Anne Shumway - “Vestibular Rehabilitation Research – Oh, the places we’ll go”
February 13, 2020	Benjamin Kivlan and Rob Roy Lee Martin “Movement System-Based Treatment Approach for the Hip Joint”
February 13, 2020	Jared Vagy and Duane Scotti “Hanging in Thin Air: Pushing and Pulling in Rock Climbers’, Circus Artists’, and Gymnasts’ Shoulders”
February 14, 2020	Ellen Anderson and Rhea Beth Jacobson “When Out Patient’s Are Using Cannabis: What Every Physical Therapist Should Know”
February 15, 2020	Janene Holmberg and Jeffery Staab “Update on Developing Successful Strategies to Manage Patients With Functional and Psychiatric Vestibular Disorders”
February 15, 2020	JJ Mowder-Tinney and Taylor Drake “Intervention Design to Optimally Progress Perturbation- Based Balance Training: Translating Research into Clinical Practice”

American Physical Therapy Association Combined Sections Meeting, New Orleans LA, Feb 22-24, 2018

February 22, 2018	“PT in the ICU: Moving Beyond Early Mobilization to Encompass a Broader Scope”
February 22, 2018	“2 nd Annual HPA Global Health Catalyst Talk: Global Health Engagement”

February 22, 2018	“Exploring Polyneuropathy: Differential Diagnosis, Cases and Current Trends
February 23, 2018	“Incorporating Mindfulness into Daily Physical Therapy Practice”
February 23, 2017	“Femoroacetabular Impingement: A Theoretical Framework to Guide Clinical Practice”
February 24, 2018	“Pediatric Orthopedic Limb Deformities: Treatment Options and Limb Lengthening”

UNLV PT Distinguished Lecture Series

April 22, 2019	“Teaching Patients about Pain” presented by Adriaan Louw PT, PhD
November 15, 2018	“Footwear Matters: Let’s think Differently about the Foot” presented by Irene Davis, PhD, PT, FACSM, FAPTA, FASB
October 26, 2017	“APTA: Pursuing our Transformative Vision” presented by Sharon Dunn PT, PhD, APTA President
April 18, 2018	“Pain Neuroscience in the Clinic” presented by Adrian Louw PT, PhD

UNLVPT Brown Bag Lectures

April 25, 2019	“Tracking the Neuroplastic Changes in the Human Motor Descending Pathways Using Transcranial Magnetic Stimulation” presented by Charalambos C. Charalambos
August 27, 2018	Stroke and Cardiovascular Health
February, 2018	“College-Based Koru Mindfulness” presented by Dr. Cost
November, 2017	Incorporating Wellness into Physical Therapy presented by Mitch Smith
November, 2017	Private Practice Outpatient Orthopedics presented by Adam Cope
September 2017	Achilles Tendinopathy
May, 2017	Canine Physical Therapy presented by Kelly Straub

Membership in Professional Organizations

2019 – Present	Member of National Student Honor Society, American Council of Academic Physical Therapy
2017 – Present	Member American Physical Therapy Association
2017 – Present	Member Nevada Physical Therapy Association

Jennifer Gorton
Email: jennifergorton.unr@gmail.com

Education

DPT Therapy	University of Nevada, Las Vegas- Las Vegas, Nevada	2017-Present	Physical
BS	University of Nevada, Reno- Reno, Nevada	2011-2016	Nutrition

Clinical Experience

Jan 2020-March 2020	Student Physical Therapist (unpaid internship)- Renown Rehabilitation Hospital, 1495 Mill St, Reno, NV 89502
Sept 2019-Dec 2019	Student Physical Therapist (unpaid internship)- Saint Mary's Regional Health Care, 235 W 6th St, Reno, NV 89503
July 2019-September 2019	Student Physical Therapist (unpaid internship)- VA Health Sierra Nevada Health Care System, 975 Kirman Ave, Reno, NV 89502
June 2018-July 2018	Student Physical Therapist (unpaid internship)- Bodywise Physical Therapy, 1667 Lucerne Street, Unit B, Minden, NV 89423
March 2016-May 2017	Physical Therapy Technician (paid)- Galena Sport Physical Therapy, 16560 Wedge Pkwy, Unit 200, Reno, NV 89511

Certifications

American Heart Association, BLS for Healthcare Providers (December 2016-December 2017, April 2018)

HIPAA Training Certified (September 2017)

Blood-borne Pathogens Training Certified (September 2017)

CITI Biomedical IRB Course Completion (March 7, 2018- March 6, 2023)

Research Interest and Experience

- *Co-Investigator*: Kubo M, Horn L, **Gorton J**, Ferraro A, Shih H, Macleod T, Lee S. Physical Therapy After Amputation in Community Dwelling Older Adults: A Quantitative and Qualitative Interview Study, *Writing/Revision stage* (Research mentor: Dr. Szu-Ping Lee)

- To investigate the utilization of physical therapy in older adults after lower extremity limb loss

Honors and Awards

2020 UNLV PT Scholarship Recipient

Service

October 20, 2018 Parkinson’s Moving Day Las Vegas- Volunteer
 April 28, 2018 Nevada Orthotics and Prosthetics Las Vegas Mobility Clinic- Volunteer
 January 19, 2018 UNLV PT 2018 Student Interview Day
 November 11, 2017 Veteran’s Day Honor Ride- Volunteer

Professional Growth and Continuing Education Attended

American Physical Therapy Association Combined Sections Meeting, Denver CO, February 12 – 15, 2020

February 13, 2020 Odessa Rene Addison and Monica Serra- “Muscle and Bone Crosstalk: A Conversation About Exercise and Nutrition”
 February 13, 2020 Jessica Drummond- “Nutrition and Lifestyle Medicine for Endometriosis Care”
 February 13, 2020 Theresa Ellis and Abigail Spaulding- “Rhythm and the Motor System: New Opportunities for Gait Training”
 February 14, 2020 Carol-Ann Nelson- “Taking Physical Therapy Outdoors: Rehab in the Real World”
 February 14, 2020 Ellen Zambo Anderson and Rhea Beth Jacobson- “When Our Patients are Using Cannabis: What Every Physical Therapist Should Know”
 February 15, 2020 Richard Willy, Elizabeth Chumanov, Jeffery Taylor-Haas, and Christa Wille- “Specialized Running Populations: Tailoring Care to Maximize a Runner’s health Across the Lifespan”
 February 15, 2020 Elizabeth Campione and Ann Jackson- “Obesity, Food Insecurity, Nutrition, and Functional Impairment: What is the Role of Physical Therapy?”

UNLV PT Distinguished Lecture Series

- November 15, 2018 “Footwear Matters: Let’s think Differently about the Foot” by Irene Davis, PhD, PT, FACSM, FAPTA, FASB
- November 16, 2018 “Well Aligned, Soft Landings: A Cure for Running Injuries?” by Irene Davis, PhD, PT, FACSM, FAPTA, FASB
- October 26, 2017 “APTA: Pursuing our Transformative Vision” by Sharon Dunn PT, PhD, APTA President
- October 27, 2017 “Disruption and Opportunity in Health Delivery: Go Hard or Go Home” by Sharon Dunn, PT, PhD, APTA President

UNLV PT Brown Bag and Guest Lectures

- June 16, 2017 “Massage Therapy of the back, neck, and shoulders” by Kelsey Taelour, LMT
- June 16, 2017 “Canine Physical Therapy” by Kelly Straub, PT
- September 21, 2017 “Pain Medicine & You” by Mahesh Kuthuru, MD
- November 16, 2017 “Incorporating Wellness Services into Practice” by Mitch Smith, PT, DPT, CWC, COS-C
- November 27, 2017 “Early Mobility in the ICU- Current Practice at the VA” by Courtney Haia, PT, DPT
- November 30, 2017 “Behavioral Evidence and Neural Correlates of Relearning of Writing Skills in Parkinson’s Disease” by Sanne Broeder
- April 18, 2018 “Pain Neuroscience in the Clinic” by Adriaan Louw, PT, PhD
- May 11, 2018 DPT 798 Research Presentations by UNLVPT graduating class of 2018
- September 6, 2018 “Why your DPT is worthless and what you can do to change it” by Beren M. Shah, PT, DPT and Rob R Robb, PT, DPT
- September 24, 2018 “Principles of Functional Soft Tissue Examination” by Dr. David Holmes, DC, CSCS, DACBSP
- October 4, 2018 “Development of a Strength Training Program in Duchenne Muscular Dystrophy” by Donovan Lott, PT, PhD

Professional Meetings:

- September 12, 2017 Nevada APTA district meeting: “Neuro Restorative- Brain Injury 10” by Julie Dendy, PT

April 10, 2018

Nevada APTA district meeting: “Nutrition and physical therapy: A multidisciplinary approach to healing” by Mickey Mazurowski RDN, LD, PTA, CLT

Membership in Professional Organizations

Member American Physical Therapy Association (2017-present)

Member Nevada Physical Therapy Association (2017-present)

Lindsey Horn

Email: lndshorn484@gmail.com

Education

DPT	University of Nevada, Las Vegas – Las Vegas, Nevada	2017-2020	Physical Therapy
BS	Pacific University – Forest Grove, Oregon	2012-2016	Exercise Science

Clinical Experience

January – March 2020	Student Physical Therapist – Kelly Hawkins Physical Therapy – 3870 W Ann Rd, Ste 110, North Las Vegas, NV 89031 <i>Outpatient Orthopedic, Worker’s Compensation</i>
October – December 2019	Student Physical Therapist – Sunrise Hospital and Medical Center – 3186 S. Maryland Pkwy, Las Vegas, NV 89109 <i>Inpatient Rehabilitation</i>
July – September 2019	Student Physical Therapist—Concentra Medical Center – 5850 Polaris Ave, Las Vegas, NV 89109 <i>Outpatient Worker’s Compensation</i>
June – August 2018	Student Physical Therapist—Spring Valley Hospital— 5400 S Rainbow Blvd, Las Vegas, NV 89118 <i>Inpatient Acute, ICU, Inpatient Rehabilitation</i>

Research Interest and Experience

Co-Investigator: Kubo M, Horn L, Gorton J, Ferraro A, Shih H, Macleod T, Lee S. Physical Therapy After Amputation in Community Dwelling Older Adults: A Quantitative and Qualitative Interview Study, *Writing/Revision stage* (Research mentor: Dr. Szu-Ping Lee)

To investigate the utilization of and satisfaction with physical therapy in older adults after lower extremity limb loss

Leadership and Service

February 8, 2019	Volunteer – 2019 Student Interview Day
February 1, 2019	Volunteer – 2019 Student Interview Day
October 20, 2018	Volunteer at Parkinson’s Moving Day Las Vegas
April 23, 2018	Kinesiology Simulation Lab
April 3, 2018	Student-led Interview – Dr. Boris Decourt, PhD
January 19, 2018	Volunteer – 2018 Student Interview Day

March, 2019	Brown Bag Movie Night – 46th Mary McMillan Lecture 2015 by Lynn Snyder-Mackler, PT, ScD, ATC, SCS, FAPTA, “Not Eureka”
February, 2019	Brown Bag Movie Night – 47th Mary McMillan Lecture 2016 by Carole B. Lewis, PT, DPT, PhD, MSG, GCS, FAPTA, “Our Future Selves: Unprecedented Opportunities”
September 2018	“Why your DPT is Worthless and What you Can do to Change it” presented by Beren Shaw PT, DPT and Rob Robb PT, DPT
February, 2018	“College-Based Koru Mindfulness” presented by Dr. Cost
January, 2018	Acute Rehabilitation presented by Pamela Smith, Kristin Turner, Cory Summerville
November, 2017	ICU in the VA presented by Courtney Haia
November, 2017	Incorporating Wellness into Physical Therapy presented by Mitch Smith
November, 2017	Private Practice Outpatient Orthopedics presented by Adam Cope
October, 2017	Federal Physical Therapy presented by Michael Tabo
May, 2017	Canine Physical Therapy presented by Kelly Straub

Membership in Professional Organizations

2017 – Present	Member American Physical Therapy Association
2017 – Present	Member Nevada Physical Therapy Association

Michaela Kubo

MichaelaMKubo@gmail.com

Education

2017 – 2020	University of Nevada, Las Vegas Doctor of Physical Therapy
2013 – 2017 Sciences	Chapman University, Crean College of Health & Behavioral Bachelor of Science in Health Science, <i>Cum Laude</i>

Clinical Experience

January – March 2020	Student Physical Therapist – Mountain View Hospital – 3100 N Tenaya Way, Department of Physical Therapy, Las Vegas, NV 89128 <i>Inpatient Acute, Emergency Department, ICU</i>
October – December 2019	Student Physical Therapist – Boulder City Hospital – 901 Adams Blvd, Department of Physical Therapy, Boulder City, NV 89005 <i>Inpatient Rehabilitation, Long Term Care Facility</i>
July – September 2019	Student Physical Therapist—Cleveland Clinic Lou Ruvo Center for Brain Health – 888 W Bonnevile Ave, Las Vegas, NV 89106 <i>Outpatient Neurorehabilitation</i>
June – August 2018	Student Physical Therapist—Fyzical Therapy and Balance Center— Dean Martin, 7770 Dean Martin Dr. Suite 307, Las Vegas, NV 89139 <i>Outpatient, Sports</i>

Research Experience

Co-Investigator: Kubo M, Horn L, Gorton J, Ferraro A, Shih H, Macleod T, Lee S. Physical Therapy After Amputation in Community Dwelling Older Adults: A Quantitative and Qualitative Interview Study, *Writing/Revision stage* (Research mentor: Dr. Szu-Ping Lee)

To investigate the utilization of physical therapy in older adults after lower extremity limb loss

Honors & Awards

2020	UNLV PT Scholarship Recipient
2019	UNLV PT Scholarship Recipient
2018	UNLV PT Scholarship Recipient

Leadership & Service

September 28, 2019	Volunteer at Parkinson's Moving Day Las Vegas
September 23, 2019	Volunteer at Fall Prevention Screening at Cleveland Clinic Lou Ruvo Center
May 10, 2019	Attendee of NV SB355 Hearing by the Committee on Commerce and Labor
April 20, 2019	Volunteer at Rock Steady Boxing & Parkinson's Screening
February 15, 2019	Volunteer at Mobile Health Collaborative
October 20, 2018	Volunteer at Parkinson's Moving Day Las Vegas
June 2, 2018	Volunteer at NVPTA OT/PT Conference
April 28, 2018	Volunteer at Las Vegas Mobility Clinic
April 23, 2018	Kinesiology Simulation Lab
January 19, 2018	UNLV PT 2018 Student Interview Day

Professional Growth & Continuing Education Attended

McKenzie Method of Mechanical Diagnosis and Therapy

March 13 – 15, 2020 Part B: Cervical & Thoracic Spine

February 8 – 10, 2019 Part A: The Lumbar Spine

American Physical Therapy Association Combined Sections Meeting, Denver CO, February 12 – 15, 2020

February 13, 2020 Anne Shumway-Cook Lectureship – “Vestibular Rehabilitation Research: Oh, the places we'll go” presented by Susan L. Whitney

February 13, 2020 “Macrovascular and Microvascular Contributors to Metabolism, Muscle, and Function in Aging: What PTs Should Know”

February 13, 2020 “Hanging in Thin Air: Pushing and Pulling in Rock Climbers', Circus Artists', and Gymnasts' Shoulders”

February 14, 2020 “Exercise Prescription for the Older Hospitalized Adult: The Certified Exercise Expert for Aging Adult Perspective”

February 14, 2020 “When Our Patients are Using Cannabis: What Every Physical Therapist Should Know”

February 14, 2020 “Pillow Talk Doesn't End after a Cancer Diagnosis: Sex and Sexuality in the Oncology Population”

February 15, 2020 “Using Pain Neuroscience Education for Patients at Different Stages of Life: 4 Case Studies”

February 15, 2020 Academy of Orthopedic Physical Therapy Platform 7

Nevada State Clinic hosted by National Strength and Conditioning Association

November 10, 2019 “Science and Application of HIIT to Programming” by Josh Henkin, CSCS

November 10, 2019 “Brain and Body Connections for Improved Performance” by John Kennedy

November 10, 2019 “How do Postural Alignment and Breathing Patterns Affect Spinal Stability and Core Muscle Recruitment?” by Elizabeth Duncanson, CSCS

November 10, 2019 “HIP HIP Hooray” by Roger Kraig, MS

November 10, 2019 “Disorder in Disguise: Recognizing the Need for Change When Common Diet Trends Cause Harm” by Leslie Schilling, MA, RDN, CSSD, CSCS

November 10, 2019 “True Performance is Not Just About Strength and Speed” by Kyle Paxton, DPT

November 10, 2019 “Strategies for Training the Older Adult Client” by Jason Lutz, CSCS

UNLV PT Distinguished Lecture Series

September 12, 2019: “Finishing the Job of Evidence Based Practice” by Anthony Delitto PT, PhD, FAPTA

November 15, 2018 “Footwear Matters: Let’s think Differently about the Foot” by Irene Davis, PhD, PT, FACSM, FAPTA, FASB

October 26, 2017 “APTA: Pursuing our Transformative Vision” by Sharon Dunn PT, PhD, APTA President

Orthotics & Prosthetics Activities Foundation: First Clinics

August 24, 2019 “First Things First: Fall Prevention, Recovery & Mitigation for Amputees” by Chris Doeger, PT, CP & OPAF and the First Clinics

September 15, 2018 “First Stride: Gait Training and Exercises for Amputees, Clinical Training for Therapists” by Chris Doeger, PT, CP & OPAF and the First Clinics

Dementia 2019: Managing a Public Health Crisis by Cleveland Clinic Lou Ruvo Center for Brain Health

May 31, 2019 “Social Engagement vs. Loneliness and Risk of Dementia” by Susan Hirsch, MSW

May 31, 2019 “Bringing Elder Neglect into Focus” by Ruth Almen, LCSW

May 31, 2019 “Assessing for Depression and Preventing Suicide in Elders” by Jason Cheng, MD

June 1, 2019 “Cerebral Changes and Neuroplasticity in Aging” by Charles Bernick, MD, MPH

- June 1, 2019 “How Exercise Modifies Cerebral Circuitry” by Jason Longhurst, PT, DPT
- June 1, 2019 “What’s New and Coming in Alzheimer Disease” by Marwan Sabbagh, MD, FAAN
- June 1, 2019 “The Anti-Alzheimer’s Diet” by Marwan Sabbagh, MD, FAAN
- June 1, 2019 “Brain Health and the Human Microbiome” by Le Hua, MD
- June 1, 2019 “Best Practices for Diagnosing Common Dementias” by Dylan Wint, MD
- June 1, 2019 “Behavioral Syndromes as Heralds of Dementing Disease” by Aaron Ritter, MD
- June 1, 2019 “Preempting Dementia Complications: A Multimodal Approach” by Dylan Wint, MD

UNLV PT Brown Bag Lectures

- April 26, 2019 “The Role and Benefits of Cancer Rehabilitation: From Diagnosis to Survivorship” by Leslie J. Waltke, PT, DPT
- November 8, 2018 “Can an Acute Exercise Bout Influence Sensorimotor Locomotor Memories?” by Charalambos Charlambous, PhD
- October 4, 2018 “Development of a Strength Training Program in Duchenne Muscular Dystrophy” by Donovan Lott, PT, PhD
- February 12, 2018 “College-Based Koru Mindfulness” presented by Dr. Costa
- November 6, 2017 Physical Rehabilitation Network presented by Adam Cope
- October 3, 2017 “Federal Physical Therapy” presented by Michael Tabo
- March 8, 2019 UNLV Interprofessional Education & Practice

UNLV PT Lecture Series

- November 16, 2018 “Well Aligned, Soft Landings: A Cure for Running Injuries?” by Irene Davis, PhD, PT, FACSM, FAPTA, FASB
- October 27, 2017 “Disruption and Opportunity in Health Delivery: Go Hard or Go Home” by Sharon Dunn, PT, PhD, APTA President

Nevada State Clinic hosted by National Strength and Conditioning Association

- November 10, 2018 “MMAFx—Hand Speed Skills & Conditioning for Football” by Bruce Lombard, Med
- November 10, 2018 “Progressing the Injured Lower Extremity Athlete from Rehab to Performance” by Morgan Crum, DPT, CSCS
- November 10, 2018 “Evolving Corrective Exercises for the Shoulder” by Jessica Bento, MPT
- November 10, 2018 “Nutrition to Naturally Enhance Hormones” by Michelle Ingels, AP

November 10, 2018	“Mobility Magic” by Ingrid Marcum, CSCS
November 10, 2018	“Programming Methods for Athletes Without an Off-Season” by Ridge Kiley, MS, CSCS
November 10, 2018	“More than Power Cleans: Weightlifting Teaching Progressions for Athletes” by Wil Fleming, USAW
November 10, 2018	“How to Use Bulgarian Bags” by Mike Salemi
<u>NVPTA OT/PT Conference</u>	
June 2, 2018	“Early Progressive Mobility” by Craig Jamison & Karen Czaja
June 2, 2018	“Interprofessional Evidence-Based Fall Prevention Dissemination: Building PT/OT Teams of Leaders” by Shannon Martin, Mindy Renfro, & Jennifer Nash
June 2, 2018	“Dementia Cognitive & Functional Assessment and Care Strategies” by Kathryn Conroy & Christine Ross
June 2, 2018	“Cannabis 101: What All Rehabilitation Practitioners Should Know” by Michael Laymon
June 2, 2018	“Oncology Rehabilitation to Promote Disease Management” by Rosalee Howell, Shirnice Villano, Kevin Carney, Peggy Nelson, Tyler Wild, & Debora S. Howell
<u>American Physical Therapy Association Combined Sections Meeting, New Orleans, LA, February 2018</u>	
Thursday, February 22:	“Responding to Emergencies: When the PT is the Most Medical Professional”
Thursday, February 22	“Movement, Pain, and Aquatic Therapy”
Thursday, February 22	“Academic Preparation for a Career in Sports Physical Therapy”
Friday, February 23:	“Task-Specific Movement Training: A Novel Treatment Approach for Chronic Lower-Extremity Pain”
Friday, February 23	“Oops, Let’s Not Do It Again: Learning from our Mistakes in Acute Care”
Saturday, February 24	“Muscle Alterations in Various Conditions of Aging: Implications for Rehab”
Saturday, February 24	“Understanding and Managing Pain in Neurodegenerative Diseases”
<u>Nevada Physical Therapy Association Southern District Meetings</u>	
November 12, 2019	“Summary of Concussions and Rehab” by Dustin Clow, PT, DPT
April 10, 2018	“Nutrition and Physical Therapy: A Multidisciplinary Approach to Healing”
September 12, 2017	“Traumatic Brain Injuries” presented by Julie Dendy and Stacy Maratello

Memberships in Professional Organizations

2017 – Present Member American Physical Therapy Association

2017 – Present Member Nevada Physical Therapy Association