THE UNIVERSITY OF SCRANTON
A JESUIT UNIVERSITY

DPT Program
Annual Research Night

Saturday, October 24, 2020
5:00 PM to 8:30 PM

- Live Remote via Zoom -

This course is approved for 3 general contact hours (CEUs). However, you must view the entire session to receive credit. The University of Scranton has pre-approved provider status with the PA State Board of Physical Therapy. The PA State Board of Physical Therapy has ultimate authority to the determination.

University of Scranton Physical Therapy:
http://www.scranton.edu/academics/pcps/physicaltherapy

Edward R. Leahy Jr. Center Clinic for the Uninsured

Physical Therapy Clinic

Our Services:

The non-profit, student-run Physical Therapy (PT) Clinic provides free services to those who have been referred by either The Leahy Medical Clinic or a health care provider. The PT Clinic allows graduate students in The Doctorate of Physical Therapy Program at the University of Scranton to serve patients under the supervision of a licensed physical therapist. The Clinic treats patients with a variety of orthopedic and neurological conditions.

Requirements:

- Resident of Lackawanna County
- Uninsured or Underinsured
- PT referral from The Leahy Medical Clinic or a health care provider

Contact Information:

• Phone: (570) 941-6563 • Fax: (570) 941-6165 • Email: leahy.ptclinic@gmail.com

The University of Scranton, McGurrin Hall
230 Kressler Court Scranton, PA 18503

Temporarily Closed for Fall 2020 Semester secondary to Pandemic Response

- Will resume operations pending approval from administration as safety permits.
- Volunteer opportunities available for licensed PTs upon reopening.

Schedule

5:00pm

Introduction: Dr. Renée M. Hakim, Chair/Program Director

Group 1:
Title: Role of Diagnostic Ultrasound in Assessing Acromiohumeral Distance and Managing Shoulder Pathologies in Physical Therapy
Authors: Steven Browning, Erin Ciarrocca, Bridget Duffy, Anthony Puglisi, Dr. Peter Leininger

Group 2:
Title: The Optimal Structure of Reflection During a Health Professional Service Trip: A Systematic Review
Authors: Dr. Janette Scardillo, Steven Browning, Nicholas Capobianco, Christian Huckfeldt

Group 3:
Title: The Effects of tDCS on Motor Performance in Adults with Ataxia: A Systematic Review
Authors: Alaina Evans, Ashley Genello, Rachel Kurtz, Rachel Outten, Dr. Jennifer Schwartz, Dr. Renée M. Hakim

Group 4:
Title: Effects of Medical Cannabis on QOL and Movement in Persons with PD: A Systematic Review
Authors: Kailyn Angelo, Kaitlyn Brogan, Claire Lacon, Nicole Sanchirico, Dr. Renée M. Hakim

Group 5:
Title: The Use of Smart Homes to Assist Older Adults with Mild Cognitive Impairment
Authors: Kaitlyn Brogan, Dr. Tracey L. Collins

Group 6:
Title: Technology-Based Adaptation Programs to Reduce Symptoms in Adults with Vestibular Hypofunction: A Systematic Review
Authors: Lauren Brogan, Mark Kate Halligan, Megan Shannon, Morgan Windisch, Dr. Janette Scardillo

Group 7:
Title: Effects of Music on Heart Rate and Blood Pressure for Patients in the Intensive Care Unit (ICU): A Meta-Analysis
Authors: Kayla Brown, Elizabeth DiGiovine, Emily Harvan, Amanda Trumpore, Dr. Anthony Carusotto, Dr. Renée M. Hakim

6:30pm

------- **BREAK** (15 minutes) -------

7:00pm

Group 8:
Title: Effects of exercise on physical health outcomes in adults in prison: A systematic review
Authors: Brittany Angrosina, Lauren Brogan, Emily Harvan, Erin Hultberg, Megan Shannon, Casey Trezza, Dr. Dana Maida, Dr. Nichloas Rodio, Dr. Jennifer Schwartz

Group 9:
Title: The Impact of Physical Therapist Delivered Ergonomic Intervention on Employees in a Physically Taxing Workplace
Authors: Iain Carey, Jake Creagh, Janine DeLucia, Casey Trezza, Dr. Peter Leininger, Dr. Joshua Prall

Group 10:
Title: Impact of Initiating PT in the Emergency Department for Older Adult Fallers: A Systematic Review
Authors: Erin Hultberg, Rachel Kosty, Lauren Wyant, Vanessa Zimmerman, Dr. Dana Maida

Group 11:
Title: The Effect of Rest on Recovery Time in Children with a Concussion: A Systematic Review.
Authors: Timmy Gray, Sean McElhare, Michael Montague, Jeffrey Sabatini, Dr. Nicholas Rodio

Group 12:
Title: Impact of Home Health Physical Therapy on Readmission Rates for Individuals with COPD
Authors: Michele Calogero, Michael Frawley, Stephen R. Kalinoski, Johanna Levine, Dr. Tracey Collins

Group 13:
Title: Impact of Functional Electrical Stimulation (FES) Cycling on Cardiovascular Fitness in Adults with Chronic Spinal Cord Injury (SCI): A Systematic Review
Authors: Katherine Broderick, Elizabeth Eichenlaub, Kathleen O'Reilly, Morgan Rentzheimer, Dr. Janette Scardillo, Dr. Jennifer Schwartz

Group 14:
Title: The Value of Home Health Physical Therapy for Frail Older Adults: A Literature Review
Authors: Kathleen O'Reilly, Dr. Tracey L. Collins

All Evidence is not Created Equal

http://www.orthopaedicprotocols.com/wp-content/uploads/2011/03/EBPRACT.pdf

PEDro Scale is a critical appraisal tool intended to identify methodological flaws in the physical therapy literature providing consumers of research evidence objective data regarding the strength of such evidence.

Study	1	2	3	4	5	6	7	8	9	10	11	Score
Grade												

1. Eligibility criteria were specified.
2. Subjects were randomly assigned to groups.
3. Allocation was concealed 4. Groups were similar at baseline.
5. Subjects were blinded.
6. Therapists who administered the treatment were blinded.
7. Assessors were blinded.
8. Measures of key outcomes were obtained from more than 85% of subjects.
9. Data were analyzed by intention to treat.
10. Statistical comparisons between groups were conducted.
11. Point measure and measures of variability were provided.

Criterion number 1 is not used to generate the total score. Therefore, the total maximum score is 10.

http://www.pedro.org.au/english/downloads/pedro-scale/

Sackett Levels of Evidence

Level of Evidence	Description
1A	Systematic review of randomized controlled trials (RCTs).
1B	RCTs with narrow confidence intervals.
1C	All or none case series.
2A	Systematic review cohort studies.
2B	Cohort study/low quality RCT.
2C	Outcomes research.
3A	Systematic review of case-controlled studies.
3B	Case-controlled study.
4	Case series, poor cohort case-controlled study.
5	Expert opinion.

Fletcher and Sackett, working for the Canadian Task Force on Periodic Health Examination in 1979, are credited as the first to develop a level of evidence scoring scale. Sackett continued to develop the scale based on his own research with the use of anti-thrombotic agents. http://www.physio-pedia.com/Grades_and_Levels_of_Evidence

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or ^poor or non-independent reference standard**	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or *n*-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, *n*-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or *n*-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non -randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

*** Level may be graded down on the basis of study quality, imprecision, indirectness (study PICO does not match questions PICO), because of inconsistency between studies, or because the absolute effect size is very small; Level may be graded up if there is a large or very large effect size.**

**** As always, a systematic review is generally better than an individual study.**

Oxford CEBM Levels (2011) cover the entire range of clinical questions, in the order (from top row to bottom row) that the clinician requires. While most ranking schemes consider strength of evidence for therapeutic effects and harms, the OCEBM system allows clinicians and patients to appraise evidence for prevalence, accuracy of diagnostic tests, prognosis, therapeutic effects, rare harms, common harms, and usefulness of (early) screening.

Methodological Index for Non-Randomized Studies (MINORS)

Table 2. The revised and validated version of MINORS

Methodological items for non-randomized studies	Score†
1. **A clearly stated aim:** the question addressed should be precise and relevant in the light of available literature 2. **Inclusion of consecutive patients**: all patients potentially fit for inclusion (satisfying the criteria for inclusion) have been included in the study during the study period (no exclusion or details about the reasons for exclusion) 3. **Prospective collection of data**: data were collected according to a protocol established before the beginning of the study 4. **Endpoints appropriate to the aim of the study**: unambiguous explanation of the criteria used to evaluate the main outcome which should be in accordance with the question addressed by the study. Also, the endpoints should be assessed on an intention-to-treat basis. 5. **Unbiased assessment of the study endpoint**: blind evaluation of objective endpoints and double-blind evaluation of subjective endpoints. Otherwise the reasons for not blinding should be stated 6. **Follow-up period appropriate to the aim of the study**: the follow-up should be sufficiently long to allow the assessment of the main endpoint and possible adverse events 7. **Loss to follow up less than 5%**: all patients should be included in the follow up. Otherwise, the proportion lost to follow up should not exceed the proportion experiencing the major endpoint 8. **Prospective calculation of the study size**: information of the size of detectable difference of interest with a calculation of 95% confidence interval, according to the expected incidence of the outcome event, and information about the level for statistical significance and estimates of power when comparing the outcomes *Additional criteria in the case of comparative study* 9. **An adequate control group**: having a gold standard diagnostic test or therapeutic intervention recognized as the optimal intervention according to the available published data 10. **Contemporary groups**: control and studied group should be managed during the same time period (no historical comparison) 11. **Baseline equivalence of groups**: the groups should be similar regarding the criteria other than the studied endpoints. Absence of confounding factors that could bias the interpretation of the results 12. **Adequate statistical analyses**: whether the statistics were in accordance with the type of study with calculation of confidence intervals or relative risk	

†The items are scored 0 (not reported), 1 (reported but inadequate) or 2 (reported and adequate). The global ideal score being 16 for non-comparative studies and 24 for comparative studies.

Group 1

Title: Role of Diagnostic Ultrasound in Assessing Acromiohumeral Distance and Managing Shoulder Pathologies in Physical Therapy*

Authors: Steven Browning, Erin Ciarrocca, Bridget Duffy, Anthony Puglisi, Dr. Peter Leininger

Hypothesis: We hypothesize that diagnostic ultrasound is increasingly used as an assessment tool for shoulder pathologies in research settings.

Methods: A search of CINAHL, Cochrane Library, ProQuest Central, and PubMed was completed using the terms: ("acromiohumeral distance" OR "acromiohumeral space") AND ("physical therapy" OR physiotherapy OR rehabilitation) AND ("diagnostic ultrasound" OR sonography OR sonogram OR ultrasonography). Search limits: English, peer-reviewed, human subjects, since 2000. Selection criteria: diagnostic ultrasound (DUS) used by a physical therapist (PT) to measure acromiohumeral distance (AHD) in adults (≥18 years) with shoulder pathologies. Each article was independently assessed by 2 reviewers using Oxford Centre for Evidence-Based Medicine guidelines (2011).

Results: 50 Total articles were screened; 19 met all criteria and were included in this qualitative synthesis. This included 3 pretest-posttest cohort studies, 4 randomized controlled trials, 2 case control studies, and 10 cross-sectional studies. Levels of evidence were assigned with 1 study scoring a 4, 4 studies scoring a 3, and 14 scoring a 2. Participants (N=1,008) ranged from age 18-90 and were assessed with DUS by a PT in acute, primary care, outpatient, subacute, day center, and research facilities. There were 750 subjects with shoulder pathologies including glenohumeral hypermobility, subacromial impingement, hemiparesis secondary to stroke, chronic rotator cuff pain, and complications of manual wheelchair use. In 10 studies DUS measured the effectiveness of interventions or therapeutic exercise; in 11 studies it was used to compare individuals with pathologies to asymptomatic shoulders. Of these, 6 studies also measured supraspinatus tendon thickness. One study found a significant relationship between AHD and symptoms consistent with subacromial impingement ($p < 0.001$). One study reported a positive correlation ($P = 0.01$) between AHD and function measured by the Western Ontario Rotator Cuff Index. One study found no significant correlation between AHD and shoulder function, measured by pain-free active range of motion and the Shoulder Pain and Disability Index ($p > 0.05$). All studies reported high interrater reliability (0.85-0.95) and intrarater reliability (0.86-0.99) with intraclass coefficients from 0.76-0.98.

Conclusions: There is moderate to strong evidence in support of PTs using DUS as a reliable assessment of AHD. Included studies used DUS strictly to determine the effectiveness of interventions and to identify structural differences between groups. Limitations to this systematic review include lack of follow-up or repeated measurement and lack of use concurrently with interventions. Future research should explore DUS as biofeedback during exercise and manual techniques, including taping and postural training, establish predictive validity, and analyze the clinical utility of this technology in terms of feasibility and cost.

Clinical Relevance: Ultrasound is an accurate, portable, safe alternative to x-ray and MRI technology for the examination of AHD. Physical therapists can use this as an assessment tool and in conjunction with interventions to treat shoulder pathologies. Current barriers to use include the amount of training, lack of reimbursement, and cost. As technology becomes affordable and more clinicians are trained to utilize it, there is great potential for increased DUS use in PT practice.

* Accepted for poster presentation at American Physical Therapy Association (APTA) Combined Sections Meeting (CSM) February 2021; Orthopaedics Section/Shoulder

Author	Diagnostic Ultrasound Use	OCEBM Score
Akkaya et al.	Outcome measure: efficacy of pendulum exercises for subacromial impingement syndrome (SIS)	2
Alibazi et al.	Outcome measure: efficacy of exercise program to on scapular dyskinesis	3
Boudreau et al.	Outcome measure: efficacy of exercise program for rotator cuff (RTC) tendinopathy	2
Cholewinski et al.	Outcome measure: RTC thickness in patients with SIS	2
De Oliveira et al.	Outcome measure: efficacy of KT tape as part of rehab program in patients with RTC tendinopathy	2
De Oliviera et al.	Outcome measure: immediate effects of KT tape in patients with RTC tendinopathy	2
Desmeules et al.	Outcome measure: relationship between changes in acromiohumeral distance (AHD) and functional outcomes in patients with SIS	3
Fournier et al.	Outcome measure: comparing functional shoulder anatomy in wheelchair users with and without RTC tendinopathy	2
Kalra et al.	Outcome measure: determining relationship between posture and AHD	2
Kumar et al.	Outcome measure: comparing ultrasound evaluation to fingerbreadth palpation in patients with post-stroke hemiplegia	2
Leong et al.	Outcome measure: relationship between AHD and supraspinatus tendon thickness with shoulder rotation strength in patients with SIS	2
Michener et al.	Assessment: supraspinatus tendon & AHD in patients with SIS	2
Navarro-Ledesmaet al.	Outcome measure: comparing AHD with the SPADI and ROM to determine function in chronic RTC pain	2
Savoie et al.	Outcome measure: assessing AHD following a 6 week rehab program in patients with SIS	3
Seitz et al.	Outcome measure: determine effectiveness of Scapular Assistance test in increasing subacromial space in patients with SIS	3
Timmons et al.	Assessment: comparing scapular orientation, subacromial space and shoulder pain in patients with SIS	2
Timmons et al.	Assessment: measured AHD during the full-can test in patients with SIS	2
Van Bladel et al.	Outcome measure: immediate & long term effects of arm slings on AHD on shoulder subluxation in stroke patients	2
Yang et al.	Outcome measure: efficacy of functional magnetic stimulation to treat glenohumeral subluxation in post stroke patient with hemiplegia	4

Group 2

Title: The Optimal Structure of Reflection During a Health Professional Service Trip: A Systematic Review*
Authors: Dr. Janette Scardillo, Steven Browning, Nicholas Capobianco, Christian Huckfeldt

Purpose: The purpose of this systematic literature review is to determine the optimal form of reflection to be performed by health professional students participating in an international service trip.
Materials and Methods: A search of PubMed, CINAHL, ProQuest Allied, and Cochrane, was conducted using the terms: ("international service") AND reflection AND (therapy OR medical OR nursing OR physician OR doctor OR "speech language pathologist" OR pharmacy OR pharmacist OR "health profession"). Search limits: English, peer-reviewed and full text journals. Inclusion criteria: international service, health professions, reflection component, and post-secondary education. Final inclusion was determined by discussion by 4 researchers. Each study was independently assessed for methodological quality by 2 reviewers using the Joanna Briggs Institute; Checklist for Qualitative Research (JBI).
Results: 252 articles were assessed; 10 qualitative and 3 mixed method studies were included in this synthesis. All studies rated yes on $\geq$7 components of the JBI checklist. 244 total participants were in undergraduate (7) or graduate (7) health professional programs including audiology (1), dietetic (1), medical doctor (1), nursing (7), PT/PTA (4), and speech language pathology (1). Study sizes ranged from 3 to 89 participants and included travel to Asia (2), Africa (4), and Central America/Caribbean (7). Trip length ranged from 1 to 8 weeks and all, but 1 trip included course credits. Written reflection mediums included journaling (12), blogging (1), during trip assignments (1) and post trip assignments or essays (9). In addition to written reflection, trips included regular verbal debriefing (7) and post trip debriefing sessions (4). Three studies evaluated the type of reflection and determined that students were able to reach moderate to critical levels of reflection during the trip. Ten studies evaluated trip impact on participants and 2 identified an impact theme related to reflection.
Conclusions: No studies determined an optimal method for reflection. All studies included written reflection and most included verbal debriefing. Journaling is widely used for service learning and was the written medium used in the majority of studies assessed (11). Reflective writing was most used for qualitative assessment (13). Limitations included small sample sizes and inconsistent thematic analysis. Additional reflection not reported in the studies was not discussed. Future research is needed to identify the optimal timing (during vs post-trip), medium (written vs verbal), and method of reflection (guided vs unstructured) to maximize impact on students.
Clinical Relevance: For written mediums, studies found moderate to critical levels of reflection and students stated that reflection impacted their trip. No studies compared the outcomes of two or more different types of reflection within the same cohort or service trip. Trip facilitators should use judgement when deciding the type of reflection appropriate for their group. Improved depth, consistency, personal/professional development, and longitudinal effects are possible outcomes of reflection that should be measured in future research.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) February 2021; Health Policy and Administration Section

Reflection Summary Table

Authors	*Profession*	*Location of Service*	*Trip Length*	*Type of Reflection*
Booth et al[12]	RN	Tanzania	10 days	Journaling, written assignment
Borstad et al[5]	PT	Mexico	10 days	Journaling, verbal discussion, written assignment
Collins et al[2]	PT	India	9 days	Journaling, written assignment
Curtin et al 2013[14]	RN	Dominican Republic	2 weeks	Journaling, verbal discussion
Curtin et al 2015, A[13]	RN	Dominican Republic	2 weeks	Journaling, verbal discussion, written assignment
Curtin et al 2015, B[15]	RN	Dominican Republic	2 weeks	Journaling, verbal discussion, written assignment
Dharamsi et al[16]	MD	Uganda, Bangladesh	8 weeks	Journaling, written assignment
Evanson et al[17]	RN	Guatemala	1 week	Journaling, verbal discussion, written assignment
Haines et al[3]	PTA	Kenya	1 month	Journaling, written assignment
Krishnan et al[18]	SLP / AUD	Zambia	2 weeks	Journaling, verbal discussion, written assignment
Ryan-Krause et al[19]	RN	Central America / Caribbean	N/A	Journaling, written assignment
Wilcox et al[20]	RN	Jamaica	10 days	Journaling
Wright et al[21]	Dietetic/PT	Belize	6 days	Blogging, verbal discussion

Group 3

Title: The Effects of Transcranial Direct Current Stimulation (tDCS) on Motor Performance in Adults with Ataxia: A Systematic Review*

Authors: Alaina Evans, Ashley Genello, Rachel Kurtz, Rachel Outten, Dr. Jennifer Schwartz, Dr. Renée M. Hakim

Background & Purpose: Transcranial direct current stimulation (tDCS) is a non-invasive technique widely used in clinical research to modulate excitability of neurons in the brain. The purpose of this systematic review was to determine the effects of tDCS on motor performance in adults with ataxia.

Methods: A literature search was conducted using Cochrane Library, Proquest Central, PubMed, and ScienceDirect databases using the search terms: ("transcranial direct current stimulation" OR "tDCS" OR "noninvasive brain stimulation" OR "neuromodulation" OR "transcranial electrical stimulation") AND ("ataxia" OR "cerebellar ataxia" OR "cerebellar degeneration" OR "neurodegenerative ataxia" OR "spinocerebellar ataxia" OR "motor ataxia"). Search limits: English language, human subjects, and peer reviewed. Selection criteria: sample of adults ≥18 years with any form of ataxia, excluding diagnoses of PD and essential tremor; intervention must include tDCS using a group comparative design. Each study was independently assessed for methodological quality by 2 reviewers who came to consensus based on Oxford Center for Evidence-Based Medicine Levels of Evidence (2011).

Results: A total of 591 articles were screened for eligibility. After thorough appraisal, 7 articles met selection criteria. Study designs included 3 randomized controlled group studies, 3 single group studies, and 1 non-randomized comparison group study. Three studies were level II evidence and 4 studies were level III. Sample sizes ranged from 9-40 participants (152 total) with cerebellar ataxia, ages ranging from 18-74 years, mean age 51 years. All but two studies delivered both sham and anodal tDCS at 2mA for ≥20min for 1-10 sessions. In the remaining studies, one compared results of anodal tDCS to a separate control group, while one delivered both anodal and cathodal tDCS. Statistically significant improvements in the tDCS group were found in two level II studies and one level III study; all 3 studies found improvements in the SARA (average difference of 3.00), while 2 of these studies also found improvements in the 9HPT, 8MWT and ICARS (average improvements of 1.44s, 1.41s and 6.44pts at 95% CI, respectively). No adverse events were reported.

Conclusion: There was mixed evidence indicating tDCS improved motor performance in patients with cerebellar ataxia. Limitations included heterogeneous samples and small sample sizes. Further research should include larger sample sizes, optimal treatment parameters, and standardized outcome measures for cerebellar ataxia.

Clinical Relevance: Anodal cerebellar tDCS administered at 2mA, 5x/week for 20 minutes over 2 weeks may be considered as a supplemental intervention to standard care for improving motor symptoms in patients with cerebellar ataxia. Clinically meaningful improvements under these conditions were shown (levels II and III evidence) in the mobility portions of the SARA, with group mean scores exceeding the MDC value of 0.3pts. Though tDCS is not yet FDA approved nor covered by insurance, this self-pay modality is a safe, inexpensive, and feasible intervention that may be effective in the challenging clinical management of cerebellar ataxia.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) February 2021; Neurology Section/General Neurology

Study	Parameters	Key Findings
Barretto et al. (2017)	**Frequency:** 1x/day for 5 consecutive days **Intensity:** 2mA, aside from 1st and last minute of session (1mA) **Time:** 20 min per motor cortex- 40 min total **Type:** sham & anodal **Location:** anode over motor area (C3&C4), cathode in supraorbital region	Anodal tDCS showed significant improvements in the gait portion and overall SARA scores post-stimulation.
Benussi et al. (2018)	**Frequency:** 5d/wk for 2 wks **Intensity:** 2mA **Time:** 20 min/ session **Type:** sham & anodal stimulation **Location:** anode over cerebellum 2cm under inion, cathode over lumbar enlargement 2cm under T11	Anodal tDCS showed significant improvements in SARA, ICARS, 9HPT and 8MW scores following 2 weeks of treatment and at 3-months post-stimulation.
Benussi et al. (2017)	**Frequency:** 10 days, 1x/day **Intensity:** 2mA **Time:** 20 mins **Type:** sham & anodal stimulation **Location:** anode 2cm under inion, cathode over R deltoid	Anodal tDCS showed significant improvements in SARA, ICARS, 9HPT and 8MW scores following 10 days of stimulation. Only SARA and ICARS showed significant carryover effects at 3-months post-stimulation.
Benussi et al. (2015)	**Frequency:** 2 sessions 1wk apart **Intensity:** 2mA **Time:** 20 min/session **Type:** sham & anodal stimulation **Location:** anode over cerebellum, cathode over R deltoid	Anodal tDCS showed significant improvements in SARA, ICARS, 9HPT, and 8MW scores following stimulation.
Grimaldi et al. (2013)	**Frequency:** 1x/day for 6 days **Intensity:** 1mA or 2mA; 30s ramp up/down **Time:** 20 min each sham & anodal stimulation; 40 mins total **Type:** sham & anodal tDCS **Location:** anode over posterior fossa 3cm R of inion for stretch reflex & mechanical counter test; anode in front of vermis at level of inion for postural tests; cathode over contralateral supraorbital region for both conditions	Anodal tDCS did not improve postural parameters nor scores on the Mechanical Counter Test.
Hulst et al. (2017)	**Frequency:** 3 sessions 1wk apart **Intensity:** 2mA with 30s ramp up/down **Time:** mean 22 mins/ session **Type:** sham & anodal cerebellar or M1 stimulation **Location:** cerebellar stimulation: anodal over R cerebellar cortex 3cm lateral to inion, cathode over R buccinator muscle; M1 stimulation anode over L cortex of 1st dorsal interosseous muscle, cathode over contralateral supraorbital region	Andoal tDCS did not improve speed of movement nor aiming errors following stimulation.
John et al. (2017)	**Frequency:** 3 sessions each 1wk apart **Intensity:** 2mA with 30s ramp up/down **Time:** mean 25 mins **Type:** sham & anodal M1 & cerebellar stimulation **Location:** cerebellar stimulation: anode over R cerebellar cortex 3cm lateral to inion, cathode over R buccinator muscle; M1 stimulation: anode over L primary motor cortex for 1dt dorsal interosseous muscle, cathode over contralateral supraorbital region	No significant or consistent effects on grip force control following anodal tDCS.

Group 4

Title: Effects of Medical Cannabis on Quality of Life (QOL) and Movement in Persons with Parkinson's Disease (PD): A Systematic Review*

Authors: Kaitlyn Brogan, Kailyn Angelo, Claire Lacon, Nicole Sanchirico, Dr. Renée M. Hakim

Purpose/Hypothesis: The purpose of this systematic review was to determine effects of medical cannabis on quality of life (QOL) and movement in persons with Parkinson's Disease (PD).

Materials and Methods: A literature search of PubMed, ProQuest, Cochrane, and CINHL was conducted using the search terms: (medical marijuana OR cannabis OR cannabinoids OR delta-9-tetrahydrocannabinol OR THC or cannabidoil or CBD) AND (Parkinsons disease OR PD). Search limits: English, human subjects, peer reviewed. Selection criteria: adults diagnosed with PD, interventions included CBD and/or THC (any route of administration), and outcomes included movement and QOL. Two reviewers independently assessed each study for methodological quality and came to consensus based on CEBM Oxford Levels of Evidence (2009).

Results: A total of 406 articles were assessed for eligibility. After detailed appraisals, 8 studies met the selection criteria. Levels of evidence ranged from 2B-4. Sample sizes ranged from 6-339 (647 total) with ages from 36-92 and a primary diagnosis of PD (H&Y Stages I-IV). Interventions varied with durations ranging from 1 day to 10 weeks with administration routes including: CBD (75, 150 mg, 300 mg), Nabilone, Cannador capsules (max .25 mg/kg THC), and Smoked/Inhaled Cannabis (0.5-1g). There was a statistically significant improvement in PDQ-39 scores after use of CBD 300 mg (-25.6) compared to placebo (-6.5) (n=1, 2b). Significant improvements in UPDRS motor scores were found baseline to post-test (n=2, 2b) following use of 0.5-1g smoked cannabis (-7.7; -9.9) and a significant reduction in levodopa-induced dyskinesia was found (2b) after use of Nabilone. One study (2b) using CBD 150-300mg found a significant decrease in UPDRS total scores compared to baseline (-16.0). There was no significant difference in UPDRS or PDQ-39 scores following use of Cannador capsules (2b). Self-reported improvements were found in QOL and movement including resting tremor (30.6%), bradykinesia (44.7%), and muscle rigidity (37.7%), with adverse events including worsening of PD-related symptoms reported in 4.7% (n=1, Level 4).

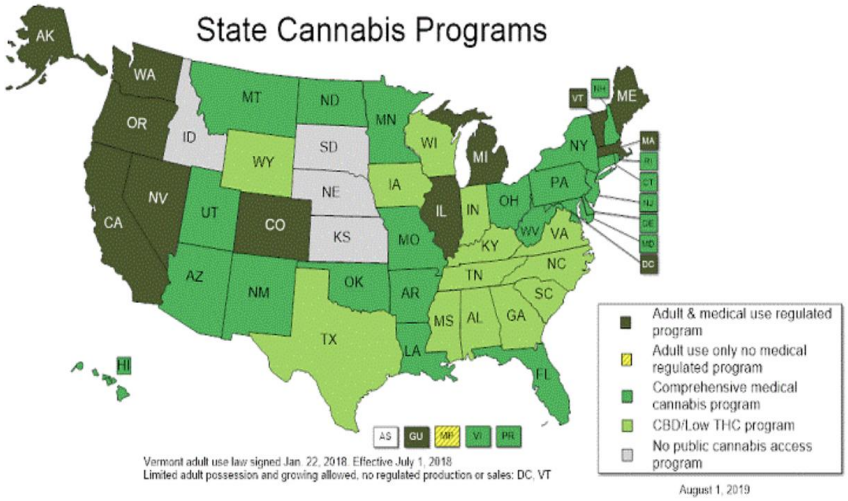
Conclusions: There is low to moderate evidence in support of using medical cannabis to improve QOL and/or movement in patients with PD. Limitations included small sample sizes, short durations, and varied administration of cannabis. Further high level research should be done to determine the optimal method and dosage in order to optimize benefits in patients with PD.

Clinical Relevance: Overall, medical cannabis treatment provides a relatively safe, feasible option to improve movement and QOL in patients with PD. Interventions of 300mg CBD, patient-specific CBD dosing (≥150mg), and 0.5g-1g cannabis resulted in meaningful improvements that exceeded the MCID values for the PDQ-39 (-4.72 pts.) or UPDRS (2.5 motor; 4.3 total pts.). The intervention of 300mg CBD, which is federally legal, had the most robust effect on motor and QOL outcomes. Clinicians should be prepared to respond with patient education and referrals as indicated for patients with PD who are considering or already using medical cannabis as a part of holistic clinical management.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) February 2021; Neurology Section/Degenerative Diseases Special Interest Group (SIG)

Medical Cannabis

- **Cannabis:** all products derived from the plant *Cannabis sativa*
- **Marijuana:** parts of or products from the plant *Cannabis sativa* that contain substantial amounts of tetrahydrocannabinol (THC)
- **Cannabinoids:** group of substances found in the cannabis plant
    - THC- substance that is primarily responsible for the effects of marijuana on a person's mental state (under U.S. law: "industrial hemp")
    - Cannabidiol (CBD)- substance found in the cannabis plant that does not give people a high or cause effect a person's mental state
- **Laws & Regulation**
    - **FDA has not approved the cannabis plant for any medical use**
        - FDA has approved several drugs that contain cannabinoids
            - *Epidiolex* (contains a purified form of CBD derived from cannabis; used to treat seizures associated with Lennox-Gastaut syndrome or Dravet syndrome)
            - *Marinol and Syndros* (contain dronabinol, synthetic THC, and Cesamet, which contains nabilone, a synthetic substance similar to THC; used to treat nausea and vomiting caused by cancer chemotherapy & loss of appetite and weight loss in people with HIV/AIDs)
    - Federal Level: Marijuana remains classified as a Schedule I substance under the Controlled Substances Act
    - 33 states, District of Columbia, Guam, Puerto Rico & U.S. Virgin Islands have approved comprehensive, publicly available medical cannabis programs
- How is medical cannabis administered?
    - Inhalation (vaping, smoking)
    - Oral Ingestion (oils, tinctures, capsules, edibles)
    - Topical (salves, balms, patches)
    - Suppositories (rectal, vaginal)
- Safety Concerns with Cannabis
    - Increased risk of MVAs
    - Smoking during pregnancy has been linked to lower birth rate
    - Higher risks of developing schizophrenia
    - Vaping can cause lung issues
    - May cause orthostatic hypotension
    - Use disorders (craving, withdrawal, lack of control, negative effects on persona; & professional responsibilities)
- Safety Concerns specific to CBD
    - Associated with abnormalities of liver function



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Group 5

Title: The Use of Smart Homes to Assist Older Adults with Mild Cognitive Impairment*
Authors: Kaitlyn Brogan, Dr. Tracey L. Collins

Purpose/Hypothesis: The purpose of this systematic review was to assess the potential uses of smart homes within the older adult population with MCI to support aging in place.
Materials and Methods: A literature search of PubMed, ProQuest, Cochrane, and CINHL was conducted using the search terms: ("smart home" OR "smart house" OR "home automation" OR "smart home technology" OR "internet of things") AND ("independent living" OR "aging in place") AND ("mild dementia" OR "mild cognitive impairment"). Search limits: English, peer reviewed, human subjects. Selection criteria: Adults with mild cognitive impairment and interventions included smart home (SH) technology to support aging in place. Each study was independently assessed by two reviewers for methodological quality based on MINORS Guidelines.
Results: 103 articles were screened for eligibility and 10 articles met the selection criteria, including 4 proposed SH technology, 1 computer simulated data, and 5 trials with human subjects. MINORs scores for 9/10 non-comparative studies ranged from 2-10/16 (avg. 4.78) and 1 comparative study scored 17/24. Sample sizes for 5/10 studies with datasets ranged from 1-94 (214 total) of patients ages 50+ with mild cognitive impairments. Interventions varied widely including use of an iPad as central hub and already existing technology. The primary outcome investigated was aging in place. One survey investigated prominent user needs to age in place and results were: falls, safety outdoors, able to orient at night, large buttons, social contact, safety, & autonomy. Most (70.45%) patients wanted to continue use of smart home after study. Two studies found that patients with MCI require prompting from the smart home, but verbal prompts were sufficient in both single & multi-domain MCI. A significant secondary outcome was decreased caregiver stress.
Conclusions: There is low to moderate evidence to support smart homes to enhance aging in place in older adults with MCI. Features should include both user input and prior success. Features that were user positive and successful included smoke detector, smart front door, automated lights, reminder/prompt service, outdoor sensor system, memory stimulation (games, family pictures), and caregiver communication with alert system. A major limitation in this area is feasibility of implementing a smart home and lack of consistency large scale studies. Further research is needed to determine a cost efficient, feasible, system that can be widely implemented.
Clinical Relevance: Adults with MCI and caregivers were satisfied with the use of smart homes to support the person's aging in place and increase safety of the person, while reducing stress on the caregiver. Clinicians should be prepared to educate patients on the resources and options available with smart homes to provide optimal aging in place for those with MCI.

* Accepted for platform presentation at APTA Combined Sections Meeting (CSM) February 2021; Home Health Section

Group 6

Title: Technology-Based Adaptation Programs to Reduce Symptoms in Adults with Vestibular Hypofunction: A Systematic Review*

Authors: Lauren Brogan, Mary Kate Halligan, Megan Shannon, Morgan Windisch, Dr. Janette Scardillo

Purpose/Hypothesis: Technology (tech) is increasingly utilized to increase patient engagement during vestibular adaptation exercises. The purpose of this study was to determine the impact of tech-based adaptation interventions on symptoms of vestibular hypofunction.=

Materials and Methods: A literature search of PubMed, CINAHL, ProQuest, and ScienceDirect, was conducted using the search terms: ("computer" OR "virtual reality" OR "smartphone" OR "video game") AND (adaptation OR gaze) AND ("vestibular loss" OR "vestibular hypofunction") NOT (test OR assessment OR children). Search limits: English, peer-reviewed journals, human subjects, published 2010-2020. Selection criteria: Tech-based interventions, vestibular adaptation protocol, group designs, adults 18+, vestibular hypofunction, symptom related outcome measures. Studies were independently assessed by 2 reviewers for methodological quality based on OCEBM Levels of Evidence (2011).

Results: A total of 323 articles were screened for eligibility and 7 studies (9 articles) met selection criteria. OCEBM levels of evidence ranged from 2-3 out of 5. Sample sizes ranged from 9-63 subjects (272 total), with average ages of 42.10-78.93. Treatment frequency and duration ranged from 8-60 sessions, lasting 20-45 min, over 5 days-4 mo. Tech included virtual reality (VR) headsets (n=3), computer programs with motion sensors (3), and DVDs (1). Two studies used tech in clinical settings: one found significant within-group changes to DVA, DGI, DHI, ABC, and one compared tech to sham and found significant differences in VOR gain. One study combining in-clinic and HEP tech found significant within-group changes to DHI. Four studies focused on only HEP tech and found significant within-group changes to VOR gain (n=2), DVA (2), DGI (3), DHI (4), and ABC (2). Two out of 3 studies comparing tech to traditional HEPs found statistically significant improvements in between-group analysis; however, these differences did not exceed MCDs. No adverse events were reported.

Conclusions: There is low to moderate evidence in support of using tech during adaptation training to improve gaze stability, dynamic visual acuity, functional gait, and self-reported dizziness measures in adults diagnosed with vestibular hypofunction. Types of tech could not be compared due to variable treatment protocols. Limitations included small sample sizes and limited ability to blind subjects and researchers. Further research is necessary to establish treatment parameters, evaluate long-term effects, and assess patient compliance.

Clinical Relevance: Clinicians may consider using available tech during adaptation exercises for adults with vestibular hypofunction. Preliminary evidence suggests that the benefits of traditional adaptation exercises can be achieved using different tech platforms including VR headsets, motion sensors, and DVDs. Low cost versions of these devices are commercially available and can be utilized to ensure patients achieve the dosage necessary for adaptation exercises. Due to lack of evidence on specific protocols, individualized clinical decision making regarding patient appropriateness and treatment parameters is required.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) February 2021; Neurology Section/Vestibular SIG

SUMMARY OF INTERVENTIONS			
Title	**Technology**	**Frequency**	**Interventions**
Micarelli et al. Vestibular rehabilitation in older adults with and without mild cognitive impairment: effects of virtual reality using a head-mounted display.	- 3D Virtual reality headset	- 4 weeks; HEP 2x/day for 30-40 min/day when no in-person therapy	**Intervention Group:** Virtual Reality HEP - Used head movement to steer car in racing game **Control Group:** Traditional vestibular HEP **Both Groups:** Traditional vestibular rehab for 4 weeks, 30-35min 2x/week
Micarelli et al. Three-dimensional head-mounted gaming task procedure maximizes effects of vestibular rehabilitation in unilateral vestibular hypofunction: a randomized controlled pilot trial.	- 3D Virtual reality headset	- 4 weeks; HEP for 20min/day	**Intervention Group:** Virtual Reality HEP - Used head movement to steer car in racing game - Seated **Control Group:** Traditional HEP with adaptation, substitution, habituation, and balance **Both Groups:** Traditional vestibular rehab 2x/week for 4 weeks for 30-45 mins
Viziano et al. Long-term effects of vestibular rehabilitation and head-mounted gaming task procedure in unilateral vestibular hypofunction: a 12-month follow-up of a randomized controlled trial.	- 3D Virtual reality headset	- 16 weeks, HEP for 20-30 min/day	- Follow-up study of "Three-dimensional head-mounted gaming task procedure maximizes effects of vestibular rehabilitation in unilateral vestibular hypofunction: a randomized controlled pilot trial" **Intervention Group:** Virtual Reality HEP - Used head movement to steer car in racing game; sitting on sofa or couch **Control Group:** Traditional vestibular HEP **Both Groups:** Traditional vestibular rehab in person 2x/wk for 16 weeks
Smaerup et al. Computer-assisted training as a complement in rehabilitation of patients with chronic vestibular dizziness—A randomized controlled trial.	- Computer webcam tracking pt headband	- 16 weeks; HEP for 20-30 min/day	**Intervention Group:** Computer game HEP - Six possible games: 3 eye stabilization, 3 postural control exercises - PT had access to usage data and contacted participants if the program was not used for 7 days **Control Group:** Traditional vestibular HEP
Smaerup et al. The use of computer-assisted home exercises to preserve physical function after a vestibular rehabilitation program: A randomized controlled study.	- Computer webcam tracking pt headband	- 12 weeks; HEP for 20-30 min/day	- Follow-up study of "Computer-assisted training as a complement in rehabilitation of patients with chronic vestibular dizziness—A randomized controlled trial" - Initiated directly following discharge from hospital **Intervention and Control Groups:** see above
Szturm et al. Home-based computer gaming in vestibular rehabilitation of gaze and balance impairment.	- Head mounted tracking system with computer	- 12 weeks, HEP 20-30 min/day, 5 days/week	- Following three 45-min PT sessions, patients used head movement to control computer games requiring quick reactionary movements in one plane (ex. brick-buster) and multiple directions (ex. timed matching, with varying degrees of background distractions and movement **Control Group:** none
Viirre et al. Vestibular rehabilitation using visual displays: Preliminary study.	- Virtual reality headset	- 5 days, 2x/day for 30 min sessions in clinical setting	**Intervention Group:** In-clinic head mounted device exercises - Interaction exercises were active search tasks on head-controlled 360 degree panorama, speed of scene was set 5-10% higher than lowest score (VOR gain) from the previous day. **Control Group:** In-clinic sham treatment - Same interaction tasks but visual image never changes. Intended to drive little to no adaptation.
Kao et al. Efficacy of a computerized sensor system for evaluation and training of dizzy patients.	- Head velocity and balance sensors used with photos on monitor	- 4 weeks, in clinic, 3x/week for 30 min sessions	- While moving head at metronome pace of 120-180 degrees/second, patients were asked to identify objects in photos on a monitor located 2m in front of them **Control Group:** none
Manso et al. Vestibular rehabilitation with visual stimuli in peripheral vestibular disorders.	- DVD with eye movement tasks	- 6 weeks; 40-min sessions 2x/week in clinic, with daily HEP	**Intervention Group:** In-clinic DVD program repeated in HEP - DVD projected onto clinic wall or on TV at home consisting of 14 eye tracking and movement tasks with progressively challenging postures and surfaces **Control Group:** Traditional vestibular rehab with daily HEP

Group 7

Title: Effects of Music on Heart Rate (HR) and Blood Pressure (BP) for Patients in the Intensive Care Unit (ICU): A Meta-Analysis*

Authors: Kayla Brown, Elizabeth DiGiovine, Emily Harvan, Amanda Trumpore, Dr. Anthony Carusotto, Dr. Renée M. Hakim

Purpose/Hypothesis: Music is a feasible, cost-effective, and safe intervention that can be utilized to control physiological parameters, improve mood, and mitigate psychological distress in healthy adults. The purpose of this systematic review was to determine how music impacts the HR and BP of patients in the ICU.

Materials and Methods: A literature search of CINAHL, Cochrane Library, ProQuest, and PubMed was conducted using search terms: ("Intensive Care Unit" OR ICU OR "Critical Care Unit" OR CCU) AND (Music OR "Music Therapy" OR Song*) AND (Vitals OR "Vital Signs" OR "Blood Pressure" OR BP OR "Heart Rate" OR HR OR physiolog*) NOT (Infant* OR Child* OR "Neonatal Intensive Care Unit" OR NICU OR Pediatric*). Search limits: human subjects, adults, peer-reviewed, and English language. Selection criteria: adults (18+ years) admitted to the ICU, RCT intervention included music, and outcomes included HR and/or BP. Two reviewers independently assessed and agreed on the quality of each study using PEDro guidelines.

Results: A total of 182 articles were screened. Post-appraisals, 18 RCTs met the selection criteria. PEDro scores ranged from 5-8/10 (avg=6.33). Samples ranged from 20-160 subjects (1295 total) aged 18-92 years (as available) with various reasons for admission. Music was administered for 1-3 consecutive days (10-240 min/session; avg. 48 min). Primary outcomes included HR and BP [systolic (SBP) and diastolic (DBP)]. Statistically significant decreases were found in 9 studies (PEDro score=6.56 avg) for at least one primary outcome with 7/14 studies for HR, 4/14 studies for SBP, and 2/11 studies for DBP, in favor of the music intervention groups. Subgroup meta-analysis of intervention groups showed decreases in overall mean differences (MD) from pre to post-intervention for HR (n=12, MD=-3.85, 95% CI [0, 5.34]), SBP (n=11, MD=-2.88, 95% CI [0, 3.02]), and DBP n=9, MD=-0.99, 95% CI [0, 2.16]. Secondary outcomes included statistically significant improvements in anxiety (STAI; n=8, MD=-7.16, 95% CI [3.22, 6.41]) and respiratory rate (n=8, MD=-1.52, 95% CI [0, 1.94]) following intervention.

Conclusions: There is mixed evidence to support the use of music therapy to improve resting vitals of patients in the ICU. Overall, the most effective treatments permitted patient preferred music. Limitations included small sample sizes, variation in music utilized, intervention duration, limited number of sessions, and lack of long-term follow-up, control of environmental conditions and pharmacological interventions. Future research is needed to justify the benefit of music on vitals in the ICU.

Clinical Relevance: Relative contraindications for active PT with patients in the ICU include: HR outside of 40-130 BPM and MAP outside of 60-110 mmHg. As changes in safety parameters should be monitored closely during each session, early intervention with patient-preferred music may be beneficial in the ICU to maintain stable vitals during PT. Although the effects are mixed, music provides a safe, cost-effective intervention that did not cause adverse events and should be considered when mobilizing patients during PT in the ICU.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) February 2021; Cardiovascular & Pulmonary Section

Music Interventions with Significant Intergroup Improvements in Primary Outcomes

Study	Number of sessions	Duration (Minutes)	Genre/ Music categories	Mode of delivery	Patient preference	Outcome
Chan et al. 2006	One	45	Soft, slow music without lyrics	MP3 player with headphones	Yes	HR
Guzetta 1989	Three over two days	20	Soothing classical music, soothing popular music, or nontraditional music (no vocalization/meter, periods of silence, and asymmetric rhythm)	Cassette tape with foam headphones	Yes	HR
Han et al. 2010	One	30	Western classical, Western light music, Chinese traditional music, or Chinese folk songs with music	CD with foam lined headphones	Yes	HR, SBP, DBP
Johnson et al. 2018	Three over two days	60	Simple, repetitive rhythm with a slow tempo of 60-80 beats per minute	iPod shuffle with headphones	Yes	SBP
Korhan et al. 2011	One	60	Classical music (Bach's 19 trio sonatas played by James Galway on flute) with a tempo of 60-66 beats per minute	Media player with disposable headphones	No	SBP
Lee et al. 2017	One	30	Western classical music, Chinese classical music, music of nature sounds, or religious music	MP3 player with headphones and adjustable volume	Yes	HR, SBP
Lee et al. 2005	One	30	Chinese classical music, religious music (Buddhist and Christian), western classical music, or music of nature sounds	CD player with headphones	Yes	HR, DBP
To et al. 2013	One	240	Classical music (*Mozart The Piano Sonatas*)	iPod with lightweight stereo headphones	No	HR
White 1999	One	20	Pre-selected classical music	CD minidisc player with headphones	Yes	HR

Group 8

Title: Effects of Exercise on Physical Health Outcomes of Adults in Prison: A Systematic Review*
Authors: Brittany Angrosina, Lauren Brogan, Emily Harvan, Erin Hultberg, Megan Shannon, Casey Trezza, Dr. Dana Maida, Dr. Nicholas Rodio, Dr. Jennifer Schwartz

Purpose/Hypothesis: Individuals in prison often have difficulty maintaining their prior health status upon incarceration. The purpose of this systematic review was to assess exercise interventions that promote and maintain physical wellness for individuals in prison.
Materials and Methods: A literature search of CINHAL, Cochrane, ProQuest, PTNow, PubMed, and ScienceDirect was conducted using the search terms: ("exercise" AND "physical activity") AND (prison OR prisoner OR jail OR inmates) AND "health" AND "intervention". Search limits: English, peer-reviewed, human subjects, adults (18+). Selection criteria: adults in prison, exercise interventions, and outcomes related to physical health. Studies were independently assessed by 2 reviewers for methodological quality based on OCEBM Levels of Evidence (2009).
Results: 1844 articles were screened for eligibility and 7 RCTs met selection criteria. Levels of evidence were all consistent with the rating of 2b. Sample sizes ranged from 19-226 subjects in prison (n=621), ages 18-58 years. Exercise interventions of varying intensities included running on a track or treadmill, cycling, strength/resistance training, stretching, and yoga. Interventions ranged 1-5 days per week for 15-90 minutes. Statistically significant improvements included: body anthropometrics (3/6 studies, BMI, weight, girth, and waist hip ratio [p=0.01-.05]), endurance (6/6 studies, 6MWT, Bruce Treadmill test, shuttle run test, and physical working capacity test [p=0.01-.034]), HR (3/3 studies, resting and peak [p=0.01-.034]), strength (2/3 studies, arm curl test and 6 rep max test [p=0.01]), VO_2Max (2/2 studies, [p=0.010]), SpO_2 (2/3 studies, [p=0.01-.05]) and BP (1/3 studies, [p=0.01]). The Pittsburgh Sleep Quality Index found statistically significant improvements within groups (1 study, [p=0.002]). 1 study found that cardio plus resistance training was better than anaerobic sprints and maximum strength lifts. 1 study found a circuit training method was beneficial. Exercising at a higher frequency versus longer duration led to better fitness results and lower injury rates in 2 studies. 2 studies reported adverse effects (minor injuries).
Conclusions: High levels of evidence exist for implementation of exercise in prisons to improve the overall health, fitness, and wellness of inmates. All studies found that some exercise was better than none. Based on these findings, a combination of aerobic running or cycling with resistance training using weights or machines appeared most beneficial. Limitations included small sample size, lack of financing for special equipment and uniforms/shoes, and high drop-out rates. In this setting, high transfer rates, low motivation, and parole led to lower level of evidence rating for RCTs.
Clinical Relevance: Incarceration commonly results in sedentary behavior, stress, depression, and sleep disturbances. The implementation of exercise programs is safe, feasible, and cost-effective to improve physical health and wellness outcomes in adult prisoners. PTs are qualified to provide programs to reduce the incidence of obesity, cardiovascular disease, and other chronic conditions within the prison setting.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) February 2021; Health Policy & Administration Section

Summary of Interventions			
Study	**Population**	**Intervention Used**	**Improved Outcomes**
Bueno-Antequera et al. (2019)	Male prison inmates with psychiatric disorders	**Control Group:** Psychotherapy, pharmacological treatment, and group therapy facilitated by psychologists and social workers, creative and recreational activities. **Intervention Group:** Resistance circuit training, cycling, walking, and sport games, 3x/week for 12 weeks.	-Body Anthropometrics -Endurance -Strength
Battaglia et al. (2013)	Male prison inmates	**Control Group:** No exercise training. **Intervention cardiovascular plus resistance training group:** 1-hour, 2x/week, consisting of 10 minutes of a general warm up, 40 minutes of aerobic exercises alternating with resistance exercise, followed by 10 minutes of stretching and muscle relaxation. **Intervention high-intensity strength training group:** 1-hour, 2x/week, consisting of a 10-minute cycling warm-up, anaerobic exercise alternated by maximal strength training and active recovery, followed by 10 minutes of cool down.	-Body Anthropometrics -SpO_2 -BP -Strength -Endurance
Cashin et al. (2008)	Male prison inmates with a chronic illness	**Control Group:** On waitlist and instructed to continue usual exercise regimen. **Intervention Group:** Cardiorespiratory endurance, strength, and flexibility training for 12 weeks.	-BP -HR -Body Anthropometrics -Endurance -SpO2
Gettman et al. (1976)	Male prison inmates	**Control Group:** Nonendurance recreational activity (2x/week). **Intervention Groups:** Treadmill training 1x, 3x, and 5x/week.	-Body Anthropometrics -Endurance -HR -VO2Max -BP -SpO2
Kerekes et al. (2017)	Male and female prison inmates	**Control Group:** Independent physical activity for 90 min/week for 10 weeks. **Intervention Group:** Yoga class for 90 minutes, 1x/week for 10 weeks.	-Pittsburgh Sleep Quality Index (PSQI)
Perez-Moreno et al. (2007)	Male prison inmates	**Control Group:** Usual sedentary lifestyle for <30-60 minutes, 3x/week. **Intervention Group**: Resistance and aerobic training for 90 minutes, 3x/week for 4 months.	-Body Anthropometrics -Endurance -HR -Strength
Pollock et al. (1977)	Male prison inmates	**Control Group:** Usual lifestyle. **Intervention Group:** Treadmill training for 15, 30, and 45 mins/day for either 3x or 5x/week)	-VO2 Max -Endurance -Body Anthropometrics

Group 9

Title: The Impact of Physical Therapist Delivered Ergonomic Intervention on Employees in a Physically Taxing Workplace

Authors: Iain Carey, Jake Creagh, Janine DeLucia, Casey Trezza, Dr. Peter Leininger, Dr. Joshua Prall

Purpose/Hypothesis: Previous systematic reviews have investigated the effects of an ergonomic intervention administered by various disciplines. This systematic review investigates the effects of a physical therapist (PT) delivered ergonomic intervention (PEI) on employees in a physically taxing workplace (PTW). The purpose of this study was to determine the effects of a PEI on the functional status and pain levels of employees in a PTW.

Materials and Methods: A literature search of ProQuest Central, Science Direct, PubMed, Taylor and Francis and EbscoHost was conducted using the search terms: ("PT" OR "physical therapy" OR "physiotherapy" OR "rehabilitation") AND ("work related musculoskeletal disorder" OR "work related injury") AND (ergonomic* OR "ergonomic intervention"). Search limits: RCTs, 2009-2020, English, peer-reviewed journal. Selection criteria: Adults 18+, a PEI in a PTW, defined as an occupation that entails prolonged strain, repetitive trauma or heavy lifting. Two reviewers independently assessed each study for methodological quality and came to consensus using PEDro guidelines.

Results: A total of 443 articles were screened for eligibility. After detailed appraisal, six RCTs met the selection criteria. PEDro scores ranged from 5-8 with an average of 6.5. Sample size ranged from 69-763 subjects (1,207 total) with the mean age ranging from 28-44. PEI treatments included worksite modifications, exercise training and education. Treatment parameters varied with durations ranging from 6-48 sessions of PEI. Follow-up evaluations ranged from 2-12 months post intervention. Five studies evaluated function. Four studies found improvements ranging from 3.77-59.4% with three studies reporting statistical significance. Five studies evaluated pain. Improvements ranged from 0.3-48.5% with four studies reporting statistical significance.

Conclusions: There is moderate to strong mixed evidence to support a PEI improves function and decreases pain for individuals in a PTW. Limitations: inconsistent outcomes and varied protocols. Future research should examine cost, productivity, and absenteeism as well as pain and function.

Clinical Relevance: Previous reviews have investigated the effect of an ergonomic assessment and intervention delivered by multiple disciplines. This review found specifically a PEI to be effective in improving pain and function in an employee in a PTW. The most effective program for pain included worksite modifications, exercise training and education. The most effective program for function included worksite modifications and education. It is important to note that two studies surpassed the minimal clinically important difference for both pain (NPRS 1.8; VAS 1.7) and function (ODI 16.23; SF-36 5), respectively. Although clinical importance was not reached in all studies, the majority saw statistically significant improvements. Based on these findings, business leaders and insurance companies should consider hiring or utilizing PTs to improve function while decreasing pain with selected workers. These improvements could ultimately contribute to reduced company costs and improve productivity related to workplace injury.

Study	Intervention	Outcome Measure	PEDro Score
Pillastrini P et al.	Individualized exercise program focused on spinal stabilization, hip and trunk strengthening Educational ergonomic brochure	**Function**: ODI **Pain**: VAS (0-10)	8/10
Welch A et al.	Workstation assessment and modification Resistance band-based exercise program focused on cervical and shoulder girdle strengthening	**Function**: None **Pain**: Subjective Scale (0-9)	7/10
Munoz-Poblete C et al.	Resistance band-based exercise program focused on stabilization of the shoulder and strengthening of the forearm, hand, and shoulder musculature	**Function**: DASH **Pain**: VAS (0-100)	7/10
Tsang SMH et al.	Workstation assessment and modification Muscle activation and relaxation techniques via electromyography biofeedback system Motor control re-education Modalities (TENS, Ultrasound)	**Function**: NDI, DASH **Pain**: NPRS	6/10
Bultmann et al.	Workstation assessment and modification	**Function**: ODI **Pain**: Scale (0-10)	6/10
Figl-Hertlein A et al.	Workstation assessment and modification Individualized exercise program focused on functional training and stretching exercises	**Function**: SF-36 **Pain**: None	5/10

Key: DASH: Disability of the Arm, Shoulder, and Hand; NDI: Neck Disability Index; NPRS: Numerical Pain Rating Scale; ODI: Oswestry Disability Index; SF-36: Short-Form-36 Health Survey Questionnaire; VAS: Visual Analog Scale

Group 10

Title: Impact of Initiating PT in the Emergency Department (ED) for Older Adult Fallers: A Systematic Review*

Authors: Erin Hultberg, Rachel Kosty, Lauren Wyant, Vanessa Zimmerman, Dr. Dana Maida

Purpose/Hypothesis: The purpose of this systematic review was to determine the impact of providing physical therapy (PT) initiated in the emergency department (ED) for older adults presenting post-fall on the incidence of recurrent falls. Materials and Methods: A literature search of Cochrane, CINAHL, ProQuest, and PubMed was conducted using search terms:(geriatric OR older adults OR seniors OR elderly) AND (physical therapy OR physical therapist OR balance assessment OR balance screen OR balance) AND (fall OR "fall related injury" OR fallers) AND ("emergency room" OR "emergency department" OR emergency). Search limits: English and peer-reviewed. Selection criteria: adults 65+ years admitted to ED post fall, interventions including PT services and/or balance assessment (BA), and outcomes including recurrent falls. Two reviewers independently assessed each study for methodological quality based on OCEBM Levels of Evidence(2009).

Results: 604 articles were screened for eligibility, yielding 10 studies after detailed appraisal (5 RCTs, 2 prospective cohort, 1 case report, 1 case control, and 1 retrospective cohort). Sample size ranged from 1-560,277 subjects (n=563,050) with mean age range 66-82.4 years. CEBM levels of evidence ranged 1B-4. Subjects received one of the following post fall: PT in the ED (2 studies), PT after discharge from ED (4 studies), or post-discharge BA by a healthcare provider and therapeutic PT intervention (4 studies). Assessment and intervention methods varied with follow-up ranging 30 days-1 year. No adverse events were reported. The primary outcome measure was recurrent falls and secondary outcomes were ED revisit rates and recurrent injurious falls. For articles reporting recurrent falls, 1 reported statistically significant improvement, 5 reported improvement without statistical significance, and 4 did not report statistical analysis. No significant difference in recurrent falls was reported for PT in the ED and the case report patient did not fall or report to the ED at 3 mo. follow-up. All articles with PT after discharge from the ED reported recurrent fall reduction; 1 specifically noted statistical significance. No articles with post-discharge BA found statistically significant results, however, 1 reported recurrent fall reduction. For secondary outcomes, 1 article reported statistically significant improvements in ED revisit rates within 30 and 60 days and 1 found statistically significant reductions in recurrent injurious falls.

Conclusions: Primarily moderate levels of evidence exist to support providing PT to older adult fallers during or after an ED visit to decrease recurrent falls. PTs were key members of the interdisciplinary team and some intervention was more effective than none. Limitations included 5 study designs, varied assessment methods, and control group contamination. Future research with standardized assessments is needed to determine optimal use of PT services.

Clinical Relevance: Older adults should receive PT services in the ED post-fall; however, if resources are unavailable, ED providers should consider referring patients to PT to facilitate appropriate intervention to decrease recurrent falls.

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) February 2021; Geriatrics Section

Article Authors	Level of Evidence	Services	Key Findings
Davidson J et al.[2]	1B	PT post discharge	• Non-statistically significant improvement in recurrent falls compared to control group
Matchar DB et al.[3]	1B	PT post discharge	• Non-statistically significant improvement in recurrent falls compared to control group • Statistically significant improvement in injurious falls compared to control group
Russell MA et al.[4]	1B	Post discharge BA by related service + PT intervention	• Non-statistically significant improvement in recurrent falls compared to control group
Tan PJ et al.[5]	1B	Post discharge BA by related service + PT intervention	• Non-statistically significant improvement in recurrent falls compared to control group
Close J et al.[6]	2B	PT post discharge	• Statistically significant improvement in recurrent falls compared to the control group
Lesser A et al.[1]	2B	PT in ED	• Non-statistically significant improvement in recurrent falls with PT services • Statistically significant improvement in ED revisit rates with PT services
Pua YH et al.[7]	2B	PT post discharge	• No statistical analysis • Improvement in injurious falls with PT
Russell MA et al.[8]	2B	Post discharge BA by related service + PT intervention	• No statistical analysis • BA predictive of risk for future falls, leading to proper referral for fall prevention intervention
Miller E et al.[9]	3B	Post discharge BA by related service + PT intervention	• No statistical analysis • Only 1.3% of patients received PT in the ED • 8.3% of patients revisited ED due to recurrent fall
Seip J et al.[10]	4	PT in ED	• Case study patient reported no additional falls or hospital admissions at 3 month follow-up with PT

Group 11

Title: The Effect of Rest on Recovery Time in Children with a Concussion: A Systematic Review*
Authors: Timmy Gray, Sean McElhare, Michael Montague, Jeffrey Sabatini, Dr. Nicholas Rodio

Background/Purpose: Most concussion research involves testing different interventions, but not the optimal amount of rest.1 The purpose of this systematic review is to determine the effect of rest on recovery time in children with a concussion.
Methods: A literature search was conducted (2009-2019) using CINAHL, PubMed/Medline, Wiley Online Library, Cochrane, science direct databases using search terms: (Pediatric OR paediatric OR kids OR children OR adolescents OR teenager OR youth) AND (Concussions OR "mild traumatic brain injury" OR mild TBI OR head injury) AND ("Physical therapy" OR Physiotherapy OR rehabilitation OR rehab) AND (Return-to-activity OR recovery). Search limits: English language, human subjects, peer reviewed. Selection criteria: all study designs were included, patients <18 years old with a concussion, and number of days of rest recorded prior to beginning activity. Each study was independently assessed by two reviewers for methodological quality based on MINORS scores.
Results: A total of 214 articles were screened for eligibility. Following detailed appraisals, 6 studies met the selection criteria. Studies included: 3 RCTs, 2 quasi-experimental studies, and 1 prospective cohort study. MINORS scores ranged from 19/24 to 23/24. Sample sizes ranged from 16-103 participants (430 total) with a concussion/mild TBI with an avg. age of 14.5. Each participant was diagnosed within the previous 2-10 days. Rest periods varied between long (>5 days) and short (≤ 5 days). Physical activity after rest included aerobic exercise, stretching, or continuation in sport. The primary outcome was number of days until recovery. 4 of 6 studies, all of which were statistically significant, recorded improved recovery when using short rest, recovering on avg. 6.41 days quicker. Secondary outcome measures included the PCSS. 3 of 6 studies reported recovery using the PCSS. 1 of 3 studies, which was statistically significant, posted an improved PCSS score by 7.62 with short rest.
Conclusions: There was moderate to strong evidence to support the use short rest compared to long rest before rehabilitation following a concussion to reduce time to return to activity in a pediatric population. Aerobic exercise following short rest resulted in the shortest recovery (avg.= 13 days) compared to other interventions.
Clinical Relevance: Clinicians may consider implementing a treatment program that begins after short rest (<5 days) and utilizing aerobic exercises in particular for pediatric patients who have been diagnosed with a concussion. This treatment approach may lead to return to activity on avg. 6.41 days quicker as most patients recorded a score <7 on the PCSS (MCD=10). 2 This treatment approach appears safe and feasible to optimize outcomes for this pediatric population with a diagnosed concussion

* Accepted for poster presentation at APTA Combined Sections Meeting (CSM) February 2021; Pediatrics Section

Article	MINORS Score	Main Intervention = Length of Rest	Recovery Time
Elbin et. al.	19/24	Immediate rest vs. Continued activity	44 days (rest) vs. 22 days (activity)
Thomas et. al.	20/24	Short vs Long rest	8 days (short rest) vs. 11 days (long rest)
Micay et. al.	23/24	Long rest: Aerobic exercise vs Usual care (After long rest)	36 days (aerobic exercise) vs. 29 days (usual care)
Leddy et. al.	21/24	Short rest: Aerobic Exercise vs. Stretching (After short rest)	13 days (aerobic exercise) vs. 17 days (stretching)
Leddy et. al.	19/24	Short rest: Aerobic Exercise vs. Continued rest (After short rest)	9 days (aerobic exercise) vs. 24 days (continued rest)
Willer et. al.	20/24	Long rest: Aerobic exercise vs. continued rest vs. stretching (After long rest)	13 days (aerobic exercise) vs. 16 days (continued rest) vs. 17 days (stretching)

Length of Rest
Short rest: < 5 days
Long rest: ≥ 5 days

Recovery
Score of ≤ 7 on PCSS (Post concussion symptom scale)

Group 12

Title: Impact of Home Health Physical Therapy on Readmission Rates for Individuals with COPD*

Authors: Michele Calogero, Michael Frawley, Stephen R. Kalinoski, Johanna Levine, Dr. Tracey Collins

Purpose/Hypothesis: The purpose of this systematic review is to determine the impact of home health (HH) PT on hospital readmission rates for individuals with COPD.

Materials and Methods: A literature search of EBSCO, PubMed, ScienceDirect, & Proquest was conducted using the search terms: ("Chronic Obstructive Pulmonary Disease" OR COPD) AND (Readmission OR "Hospital Readmission") AND ("Physical Therapy" OR Rehab OR Rehabilitation OR Physiotherapy) AND ("Home Health" OR "Home Care" OR "Home Healthcare"). Search limits: English, peer-reviewed, and human subjects. Study designs: RCT, quasi experimental, and cohort studies. Selection criteria: Adults 18 years or older with COPD receiving HH PT at least once a week and included a primary outcome of readmission rates defined as any acute exacerbation leading to a hospital readmission following discharge. Primary outcome: readmission rates, any acute exacerbation leading to a hospital readmission following discharge. Each study was independently assessed by two reviewers for methodological quality and came to consensus based on Oxford Levels of Evidence (2009).

Results: A total of 267 articles were screened for eligibility. After detailed appraisal, 5 studies met selection criteria which included 3 RCTs, 1 retrospective cohort study, and 1 case-control study. Levels of evidence ranged from 2-4. Samples ranged from 50-15,030 (15,476 total) with the mean age of 73.4 (18-92 years) with all participants having a confirmed diagnosis of COPD and a previous hospital admission that year. HH treatment parameters varied widely with durations ranging from 1-5 times per week lasting anywhere from 8 weeks to 2 years. No adverse events were reported. Four of the 5 studies reported statistically significant reduction in readmission rates (27% of the collected sample population were readmitted). One study reported less days in the hospital for the HH group compared to the control group (0 vs 7 respectively). Interventions with the most success (50% reduced hospitalizations) incorporated respiratory therapy and specific exercise training to target dyspnea symptoms.

Conclusions: There is moderate to strong evidence that HH PT, with individualized discharge plans, decreases hospital readmission rates in patients with COPD. Limitations included small sample size and vague description of interventions. Future research should utilize a larger sample size, in depth intervention descriptions, and high level study designs, such as a prospective study. These adaptations will allow for a more proactive approach in analyzing ongoing influences on readmission rates.

Clinical Relevance: Hospital readmission rates for patients with COPD experience a significant increase in the absence of appropriate HH PT that emphasizes the fundamental strategies tailored to this specific diagnosis. Clinicians should consider Home Health PT as part of the discharge plan for patients with COPD to prevent hospital readmission.

* Accepted for platform presentation at APTA Combined Sections Meeting (CSM) February 2021; Home Health Section

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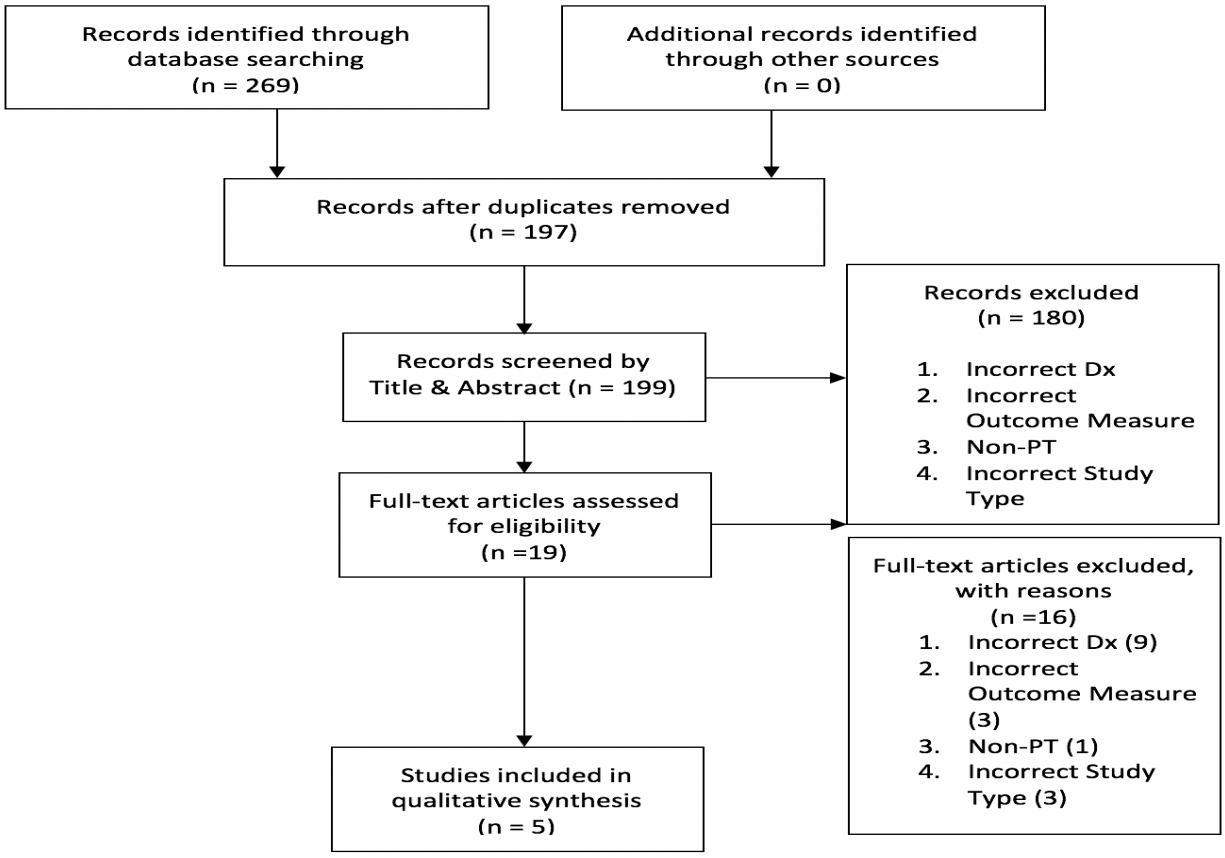

Article Citation	Study Design	CEBM Score
1. Alhelali et al.	Case-Control Study	3B
2. Broadbent et al.	RCT	1B
3. Lainscak et al.	RCT	1B
4. Lalmolda et al.	Retrospective Cohort Study	2B
5. Lohman et al.	RCT	1B

Group 13

Title: Impact of Functional Electrical Stimulation (FES) Cycling on Cardiovascular Fitness in Adults with Chronic Spinal Cord Injury (SCI): A Systematic Review*

Authors: Katherine Broderick, Elizabeth Eichenlaub, Kathleen O'Reilly, Morgan Rentzheimer, Dr. Janette Scardillo, Dr. Jennifer Schwartz
Advisor: Dr. John P. Sanko

Purpose/Hypothesis: The purpose of this systematic review was to determine the impact of utilizing Functional Electrical Stimulation (FES) cycling interventions to improve the cardiovascular fitness (CVF) of adults with chronic SCI.
Materials and Methods: A literature search was conducted in CINAHL, Cochrane, ProQuest: Health & Medical Collection, and PubMed databases using search terms: ("spinal cord injury" OR "spinal injury") AND (hybrid OR "functional electrical stimulation" OR FES) AND (cardiovascular OR cardiopulmonary OR cardiorespiratory) AND (cycle OR cycling) AND fitness. Search limits: peer reviewed journals, human subjects. Selection criteria: adults(≥18 y.o.), chronic spinal cord injuries(≥6 mos), use of upper and/or lower FES cycling, and objective measures of cardiovascular fitness. Each study was independently assessed by two reviewers who came to consensus for methodological quality based on the MINORS Scale.
Results: A total of 304 articles were screened for eligibility. After detailed appraisal, 8 studies met the selection criteria:1 case report and 7 non-randomized group studies. MINORS scores ranged from 8 to 12/16(avg 10/16) for non-comparative studies(n=7). Sample size ranged from 1-18 participants(79 total) aged 20-70 y.o. Description of SCI: 0.5-29 years since injury, ASIA A-C classifications, 65% paraplegic, and 35% tetraplegic. Training varied widely in intensity, frequency(2-5x/wk), duration(4-52wks), equipment, electrode placement, and stimulation parameters. Cycling protocols included lower extremity(LE;n=7), hybrid(n=4), and upper extremity(UE;n=1). Crossover studies examined LE vs hybrid(n=2). Statistically significant improvements in cardiovascular outcome measures: peak oxygen uptake(n=6; avg increase 20%, 1 not reported[NR]), peak heart rate(n=3; 13.5%, 1NR), cardiac output(n=2; 20.4%), stroke volume(n=2; 33%, 1NR), pulmonary ventilation(n=3; 24.5%), carbon dioxide production(n=1; 22%), and resting blood pressure(n=1; NR). An adverse event of shoulder dysfunction exacerbation was reported in 1 study.
Conclusions: There is primarily moderate level evidence to support the improvement of CVF in adults with chronic SCI through FES cycling interventions at varying training parameters. Reviewed studies did not determine the most effective type of cycling. Limitations include training effect in crossover studies, lack of established training protocols for varying SCI levels, small sample sizes, and lack of long-term follow up. Future studies should focus on determining optimal training parameters such as training intensity for FES cycling in adults with chronic SCI.
Clinical Relevance: FES cycling may be considered a safe, feasible intervention to improve CVF in individuals with chronic SCI. Overall, the evidence shows improvements in several CVF outcome measures by as much as 33% following UE, LE, and hybrid cycling. Researchers suggest hybrid stresses the cardiovascular system more, leading to greater cardiovascular improvements over time, however this was not measured in these studies. Due to lack of evidence on specific protocols, individualized clinical decision making regarding treatment parameters is required.

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Summary of FES Interventions				
Study	**Type of Intervention**	**Training Sessions**	**Training Duration**	**MINORS Score**
Brurok et al	LE, UE, Hybrid	3x per week	8 weeks	**12/16**
Janssen et al	LE	2-3x per week	6 weeks	**11/16**
Krauss et al	LE, Hybrid	3x per week	12 weeks	**11/16**
Faghri et al	LE	3x per week	12 weeks	**10/16**
Kakebeeke et al	LE	3-5x per week	52 weeks	**9/16**
Heesterbeek et al	Hybrid	2-3x per week	4 weeks	**9/16**
Hooker et al	LE	2-3x per week	12-16 weeks	**8/16**
Mutton et al	LE, Hybrid	2x per week	12 weeks	**8/16**

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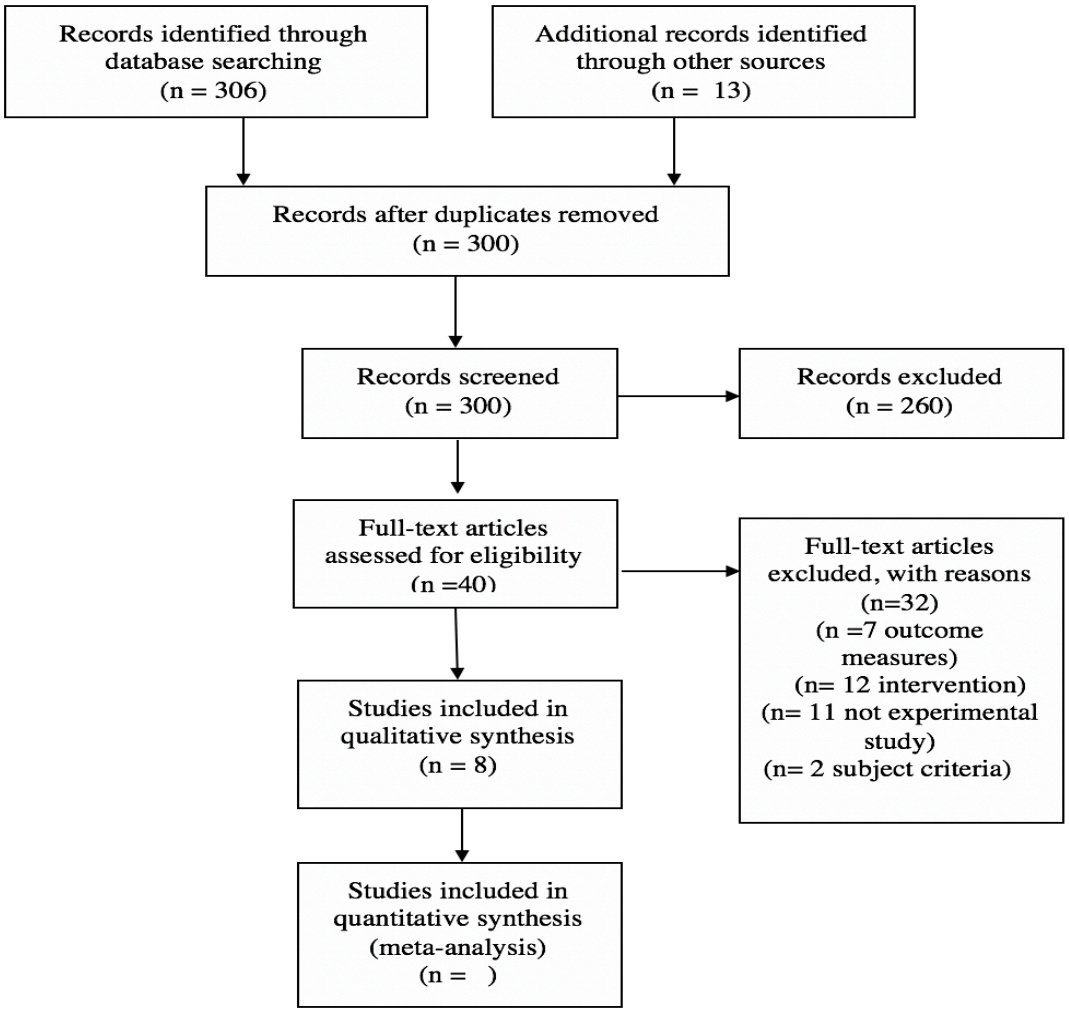

Group 14

Title: The Value of Home Health Physical Therapy for Frail Older Adults: A Literature Review*
Authors: Kathleen O'Reilly, Dr. Tracey L. Collins

Purpose/Hypothesis:
Frail older adults make up a large percentage of the population seeking care, and this percentage is predicted to increase over the next two decades. Frail older adults are at an increased risk for negative health outcomes including falls, disability, long-term care, and mortality. One of the major costs related to caring for individuals with frailty is the cost of institutionalization, as frailty is one of the major predictors of institutionalization. Aging in place can serve as a cost effective alternative to institutionalization as it aims to prolong the independent living status of frail older adults.3 In addition to decreasing healthcare costs, home health physical therapy via an aging in place policy can increase patient satisfaction. It allows patients to remain functionally independent in a familiar environment and maintain their normal social networks; which results in an overall increase in quality of life.
The purpose of this literature review was to evaluate the value of home health physical therapy services for community dwelling older adults living with frailty.
Materials and Methods: A literature search was conducted in CINAHL, Cochrane, Proquest and Pubmed databases using search terms: (frail OR "frail elderly" OR "frail older adults") AND ("home health" OR "home care" OR "home-based rehab") AND (physical therapy OR physiotherapy OR rehabilitation) AND (value OR "patient experience" OR "patient satisfaction" OR "quality of life"). A total of 120 articles were screened for eligibility. Two articles were found to include value related outcomes for home health physical therapy services for individuals with frailty, published within the last ten years.
Results: The first article had a sample size was 299 participants in baseline characteristics of an RCT study. Inverse relationships between frailty and health-related quality of life (HRQoL) as well as frailty and FIM scores were reported. The second article described a study protocol of home-based physical therapy RCT including12 weeks of physical therapy sessions delivered in the home two times per week. Sessions included a warm-up, strength, flexibility, and balance exercises as well as functional training. Outcomes to be assessed at baseline as well as 3, 6, 12 and 24 months after start date.
Conclusions: There is very little current research on cost related and patient experience outcomes as components of the value of home health physical therapy for older adults living with frailty. The lack of evidence found in this literature review indicates the need for research regarding the value of home health physical therapy services for individuals living with frailty.
Clinical Relevance: Physical therapy services delivered in the home may help decrease health care costs and increase patient experience for individuals living with frailty. Home health physical therapy may help prolong duration of home living for this population.
No 2nd page needed

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