UNIVERSITY OF SOUTHERN CALIFORNIA **OT 574**
Chan Division of Occupational Science and Occupational Therapy Spring 2023

ENHANCING MOTOR CONTROL FOR OCCUPATION

COURSE SYLLABUS

Lecture/Lab: Tuesday, 5:30-9:00 pm
California Rehabilitation Institute
2070 Century Park East
Los Angeles, California 90067
Hospital Main #: 424-522-7100
In person

Experiential Activities: Participation in Rehabilitation Setting-4 hours per week, 5 times

Dates: January 10–April 25, 2023

Office Hours: Tuesday, 4:30 – 5:30 pm or by appointment

Course Instructors:

Pamela Roberts, PhD, OTR/L, SCFES, FAOTA, CPHQ, FNAP, FACRM
Cell: 818-590-0004
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Carly Roberts, OTD, OTR/L
E-mail: CaDRoberts@californiarehabinstitute.com

Clinical Instructors for Experiential Activities: Occupational Therapy Staff
California Rehabilitation Institute and Cedars-Sinai

COURSE DESCRIPTION:

This clinical course is an elective and can be applied toward the elective requirements for the Master of Arts in Occupational Therapy and Occupational Science. The course provides students with an in depth understanding of principles and methods for remediation of motor control problems following upper motor neuron lesions. Through journal article review, assigned readings, seminar discussions, laboratory experiences and participation in an adult rehabilitation setting, students will learn theories and concepts of motor control and motor learning, as well as their application to the impairments and disabilities of individuals with upper motor neuron lesions. The course will review basic anatomy and biomechanics of the trunk and upper extremity, and the ways in which typical motor control problems of the adult with hemiplegia/hemiparesis interfere with performance in occupation. With supervision and instructor feedback, students will practice movement analysis, assessment, handling skills, and intervention approaches along with occupation-based interventions. Students will participate in journal article reviews to facilitate concise review of literature, clinical reasoning, and application of current evidence to course concepts. The course will be held at California Rehabilitation Institute offering students the opportunity to observe intervention and engage with patients and clinicians on a regular basis. The course will include observation of specific motor assessments and occupational therapy intervention for adults recovering from stroke and/or acquired brain injury or neurological disease.

GOALS AND LEARNING OBJECTIVES:

The overall goals of this course are for the student to: (1) learn core knowledge related to the occupational therapy role with people who have motor control problems that interferes with their daily occupations, (2) use this knowledge for clinical problem solving, and (3) understand how occupational therapy's unique perspective enhances motor control for occupation. These goals are further specified in the following behavioral objectives.

Upon completion of this course, the student will:

1. comprehend contemporary theories of motor control and current understanding of motor control deficits following an upper motor neuron lesion.

2. identify intervention strategies for the treatment of motor control deficits following an upper motor neuron lesion.

3. identify motor deficits to develop intervention strategies for remediation of motor control deficits.

4. develop observation skills and handling strategies for remediation of motor control deficits.

5. integrate intervention strategies within a comprehensive, occupation-centered treatment plan.

6. develop skill in presenting brief and concise review and discussion of relevant clinical literature in a group setting.

7. understand the basic principles of a variety of motor control approaches

8. assess motor control and occupational deficits of an individual with a stroke and/or acquired brain injury or neurological disease.

9. structure a treatment program, including individual sessions, to achieve improvements in motor control in preparation for and during occupation.

10. develop motor control management strategies for treatment, including mobilization and handling.

11. analyze typical movement patterns in occupation.

12. incorporate principles of various motor control approaches into an occupation-centered framework of care.

13. demonstrate ability to perform selected motor standardized assessments.

14. demonstrate ability to document motor assessment and intervention.

CLASS POLICIES AND PROCEDURES:

SAFETY IN THE HOSPITAL

Hospital practices that follow the CDC guidelines will be enforced including temperature checks, masks at all times, handwashing, etc. If you have any symptoms, do not come to class if in person or experiential sessions and we will determine alternatives to make up the time.

ADA

Students requesting academic accommodations based on a disability are required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP when adequate documentation is filed. Please be sure the letter is delivered to the instructor as early in the semester as possible. DSP is open Monday-Friday, 8:30-5:00. The office is in Student Union 301, and their phone number is (213) 740-0776.

University Student Conduct Code

The Student Handbook specifies the "Student Conduct Code" principles and procedures. All students are required to read and understand the Conduct Code. Violations of the Code include but are not limited to plagiarism, fabrication, unauthorized collaboration, and violation of examinations. Code violations and sanctions are outlined in the student manual. These standards of academic integrity will be adhered to in this class. Please feel free to ask questions and obtain clarification regarding academic integrity.

Statement on Academic Conduct and Support Systems

Academic Conduct:
Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:
Student Health Counseling Services - (213) 740-7711 – 24/7 on call
engemannshc.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 – 24/7 on call
engemannshc.usc.edu/rsvp
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) | Title IX - (213) 740-5086
equity.usc.edu, titleix.usc.edu
Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

Bias Assessment Response and Support - (213) 740-2421
studentaffairs.usc.edu/bias-assessment-response-support
Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

USC Office of Student Accessibility Services - (213) 740-0776
osas.usc.edu
Students requesting academic accommodations based on a disability are required to register with the Office of Student Accessibility Services (OSAS) each semester. A letter of verification for approved accommodations can be obtained from OSAS when adequate documentation is filed. Please be sure the letter is delivered to the instructor as early in the semester as possible. OSAS is open Monday-Friday, 8:30-5:00. The office is at Grace Ford Salvatory 120, and their phone number is (213) 740-0776.

USC Support and Advocacy - (213) 821-4710
studentaffairs.usc.edu/ssa
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101
diversity.usc.edu
Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
dps.usc.edu, emergency.usc.edu
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call
dps.usc.edu
Non-emergency assistance or information.

Attendance

Class attendance is required. However, if a student is unable to attend class (due to personal illness, death in immediate family, or professional activities that have prior approval) the instructor must be notified. If you are unable to attend class leave a message for the instructor at 818-590-0004. Attendance will be included in the evaluation of participation for the course.

Course Delivery

This course will be delivered in person format that includes lecture and lab in person at California Rehabilitation Institute.

Assignments

Students are expected to read assignments before coming to class. Students are required to complete the assignment participation in the rehabilitation setting weekly.
Students are responsible for obtaining handouts and assignments distributed in class and/or posted on Blackboard.

California Rehabilitation Institute Requirements

- All students must wear a white collared plain shirt (no logos, writing, etc.) and black pants (no jeans), closed toe flat shoes and socks when observing patient treatment. If you do not comply, you will be unable to participate in the course. This is required for your weekly participation but not for class on Tuesday evenings.
- All students **MUST** provide evidence of flu vaccine and COVID-19 vaccine PRIOR to the first day of class. Students who do not provide proof of flu vaccine and COVID-19 vaccine, will be unable to participate in this course.
- Students **MUST** provide the following PRIOR to the first day of class to participate in this course. A representative from California Rehabilitation Institute will email you for these documents.
    - Valid CPR card
    - Date of birth
    - Last 4 digits of your social security number
    - TB status including date clearance
    - Health clearance that includes evidence of measles, mumps, rubella, Hepatitis B and varicella
    - Proof of flu vaccine
    - Proof of COVID-19 vaccine
- Students must sign the specific California Rehabilitation Institute documents during first day of class.
- If a student is assigned to do clinicals at Cedars-Sinai, there will be additional required paperwork.

Student's Role:

- Attend all scheduled class sessions – except in case of illness or emergency, at which time you should notify instructor of absence **IN ADVANCE**. Unexplained absences or more than one absence may result in an incomplete grade in the course.
- Provide necessary health clearance and HIPAA and CPR certification as requested by California Rehabilitation Institute by the first class.
- Complete necessary paperwork required by California Rehabilitation Institute by the first day of the course. Abide by California Rehabilitation Institute policies and dress code (black pants and white collared shirt) for clinical work.
- Participate in all lecture discussions and lab activities, including discussions, problem-solving sessions, and patient intervention.
- Complete readings as selected by course instructor and peers.
- Participate in patient group sessions as directed (see assignments).
- Submit written intervention plans to instructors for each intervention session as directed (see assignments).
- Prepare all written assignments as outlined by course instructor (see assignments). Submit written assignments according to established deadlines.

Instructor's Role:

- Attend all scheduled class meetings – except in case of illness or emergency – or notify students in advance of cancellation or substitution.
- Prepare course syllabus and class schedule
- Prepare lecture and lab materials to guide students' learning experiences.
- Facilitate students' learning through multimedia lecture presentations and lab demonstrations.
- Facilitate students' learning experiences through individualized feedback during lab practice sessions.
- Complete readings in conjunction with students for review and discussion.
- Facilitation discussions and problem-solving sessions.
- Arrange for clinical observations and participation in treatment in coordination with Occupational Therapy staff at California Rehabilitation Institute. Attend selected observations to facilitate discussion and synthesis in relation to course material.
- Provide clear and written guidelines for all assignments.
- Provide feedback on all assignments within one week unless communicated.
- Be available for office hours weekly and flexible for additional appointments.

COURSE READINGS:

REQUIRED RESOURCES:

Readings will be provided by instructor and/or course participants. Students must be able to independently access additional readings, available on-line through USC electronic journals at http://www.usc.edu/libraries/index.php#ejournals.

ADDITIONAL RESOURCES (not required):

Gillen, G. (Ed.) (2011). *Stroke Rehabilitation: A Function-Based Approach, Third Edition*. St. Louis: Mosby.

Rosenbaum, D. A. (2010). Human Motor Control, Second Edition. Burlington, MA: Elsevier, Inc.

COURSE GRADING:

This course is a Credit/No Credit course. Therefore, no letter grade will be assigned. Students satisfactorily completing ALL "learning experiences/assignments" (see below) will receive credit for the course.

Assignment	Points
Motor Control Observation	5 points
Postural Drawing	5 points
COPM Assignment	5 points
Fugl-Meyer Assignment	5 points
Modified Ashworth	5 points
Class Participation	12 points
Journal Article Presentation	28 points
Case Presentation	35 points
Total	**100 points**

EXPERIENTIAL ACTIVITIES/ASSIGNMENTS:

Class Participation
Students are expected to attend and participate in class discussions and problem-solving sessions, and to participate actively with peers in laboratory practice of "hands-on" methods to integrate theory and handling skills in motor control, as instructed. Students will also be asked to volunteer as lab models during demonstrations.

Experiential Activities/Sessions
In addition to scheduled class time, each student will observe and participate in designated occupational therapy sessions at California Rehabilitation Institute or Cedars-Sinai. Each student will be assigned to a clinical instructor for experiential activities and will be involved in assessment, intervention, and documentation, based upon course materials and instruction by California Rehabilitation Institute occupational therapy staff. Students must provide all documentation required by California Rehabilitation Institute for participation with patients. Professionalism in behavior and personal presentation is expected in the clinical community. **Students must attend 5 experiential activities/sessions**. Students are expected to notify instructor and assistant instructor in advance if unable to attend experiential session, and each student is responsible for scheduling a time with the identified instructor to make up the session. At the end of the course, each person must have participated and completed all experiential assignments to receive a passing grade for the course.

OT 574: Enhancing Motor Control for Occupation Experiential Assignments

Week	Experiential Assignments
Week 2: Week of 1/16-1/20	Complete Patient Observation of Motor Control Activities **Due 1/31/23**
Week 3: Week of 1/22-27	**Over the time period below, the following observations should be completed.** • Complete Drawing of Front and Back and Complete Observation Assessment of Neck, Trunk, Shoulder, and Scapula • Observe and complete COPM and Observe treatment based on COPM goals including patient's response and your overall reflection in terms of motor control intervention • Observe and perform assessment of at least one patient using Fugl-Meyer Motor • Observe the Modified Ashworth Scale and Occupational Therapy of Evaluation and Complete Modified Ashworth Assignment
Week 4: Week of 1/30-2/3	
Week 5: Week of 2/6-2/10	
Week 6: Week of 2/13-2/17	
Due by 2/21	**1. Drawing and Complete Observation of Assessment of Neck, Trunk, Shoulder, and Scapula** **2. COPM and COPM treatment based on goals and overall reflection in terms of motor control intervention** **3. Fugl-Meyer Assessment and Treatment Plan for Motor Control** **4. Modified Ashworth Assignment and Treatment Plan for Motor Control** *****Submit by uploading to blackboard by individual link assignment.**
Journal Article Presentations-April 4	PowerPoint for each student group on journal presentation
Case Presentations April 18 and 25	Case Presentations Pick patient from treatment observations and start to integrate into the final case study

Examining the Evidence: Journal Article Discussions
Students will work in groups of two. One student will present an article on side of the topic and the other student will present on the other side of the topic. There will be a sign up for the article pairs. Each student will provide a 10-minute presentation of article discussion based on the guide and provided via a PowerPoint presentation.

Topic areas might include, but are not limited to:

- Remediation versus Compensation
- Therapeutic Exercise versus Occupation
- Technology versus no technology
- Two different uses of arts in therapy (e.g. art versus music)
- Use of electrical stimulation versus no use of electrical stimulation or two different types of modalities
- Two different theories on motor control

In advance of chosen week/article discussion: Provide others in the course either a link to the article or PDF file.
On the day of the article review: Briefly present the article using a PowerPoint presentation based on the elements of the article guide and facilitate discussion in relation to 1-2 questions.

Group Case Presentations
For the case presentation, students will analyze normal movement requirements of a variety of occupations linked to the patients' goals, as well as present a summary of each patient and intervention process.

- **April 11:** Work Session for presentations
- **April 18 and 25:** Each student pair will do a 15-minute presentation of a patient's case with visual materials for the last two sessions. Visual material (if used) must follow California Rehabilitation Institute release requirements. The presentation should address movement and occupational goals; how intervention was structured including preparation, movement skills, and occupation; and highlights of the intervention process. Discussion should relate to evidence. Cases should be presented in a professional manner. Refer to Case Presentation Format. All presentations must include a PowerPoint presentation.

OT 574: CLASS SCHEDULE & READINGS

WEEK:	DATE:	TOPIC:	READINGS:
1	**January 10**	**Course Introduction** Students' Goals Scheduling Intervention Times-Weekly Observation Sign Up **California Rehabilitation Institute Orientation** **Theoretical Foundation of Motor Learning (Motor Program Theory and Dynamic Systems Theory)** **Review of Evidence-Based Practice Concepts** **Trends in Rehabilitation** **Dosage, Frequency, Duration** **Introductory Concepts of Motor Control**	Bass-Haugen et al. (2008) Langhammer (2000) Page et al. (2012) Phipps & Roberts (2012) Stinear (2010) Wadden et al., (2017) Hardwick et al., (2017)
2	**January 17**	**Biomechanical Concepts and Motor Control: Principles of Handling or "Facilitation" or "Inhibition"** **Breakdown of a Motor Control Session: Development of Upper Extremity Function: Grading and Sequencing Interventions** **Assessment** Lab 1. Assessment of Tone-	Dobkin (2005) Hsieh et al. (2002) Gladstone et al., (2002) Law et al., (1990) Lundy-Ekman (2002) Phipps & Richardson (2007) Wolf et al. (2001) Velozo & Woodbury (2011) Ryerson & Levit (1997) Sanford et al. (1993) Sullivan et al. (2011)

		Modified Ashworth 2. Motor Activity Log (MAL) 3. Canadian Occupational Performance Measure (COPM) 4. Fugl-Meyer Motor Assessment-Upper Extremity	
3	**January 24**	**Trunk Assessment, Facilitation, and Mobilization** **Balance Assessments** • Functional Reach Test • Function in Sitting Test (FIST)	Bender & McKenna (2001) Michaelson & Levin (2004) Pollock, et al. (2000) Verheyden et al. (2004)
4	**January 31**	**Scapula and Shoulder Movement and Positioning** **Shoulder Girdle** • Review of Anatomy and Biomechanics • Assessment • Shoulder Subluxation (Positioning, Taping, Slings)	Dieruf et al. (2005) Goldstein (2004) Bender et al. (2001) Borg-Stein & Simons (2002) Hayner (2012) Mehta et al., (2013) Jackson et al. (2002) Jaraczewska & Lang (2006) Paci, Nannetti & Rinaldi (2005)
5	**February 7**	**Elbow, Wrist and Finger Management and Grading Activities**	Sabari (2008) Harris et al. (2009) Stoeckmann (2001)
6	**February 14**	**Other Treatment Interventions for Tone Management and Inhibitory Casting**	Mortenson and Eng (2003) Renner, Brendel, and Hummelsheim (2020)
7	**February 21**	**Neuromuscular Electrical Stimulation (NMES)** Shoulder Subluxation Upper Extremity Facilitation Alternative E-Stim (e.g. Bioness)	Baker, L (2000) Chapters 1 & 2 Patten et al. (2004) Baker, L. (2000) Chapters 1 & 2 Gustafsson et al. (2014)

		Guest Lab Instructor	
8	**February 28**	**Edema Management** Coban, Contrast Bath, Icing, Compression glove, Retrograde massage	Miller et al. (2017)
9	**March 7**	**Spasticity Management** **Robotics and Exoskeletons/Technology/ Mirror Therapy** **Virtual Reality** **Other Technology** **Handling in Occupation: Handling during Function** **Guest Lab Instructors**	Baker, L: Chapters 1 & 2 Ezendam et al. (2009) Kwakkel, Kollen & Krebs (2008) Lo et al. (2010) Rothgangel et al. (2011) Hsu et al. (2019) Hatem et al. (2016) Chen et al., (2021) Norouzi-Gheidari et al., (2012) Alex et al., (2021) Dromerick et al. (2006) Richards et al. (2000) Steultjens (2003) Wiles et al. (2004) AOTA (2020)
10	**March 14**	**Spring Break**	
11	**March 21**	**Externship**	
12	**March 28**	**Externship**	
13	**April 4**	**Evidence-Based Journal Review**	Examining the Evidence: Journal Article Selections
14	**April 11**	**Documentation Lecture and Preparation/Work Session**	Documentation Lecture and Work Session
15	**April 18**	**Case Presentations**	
16	**April 25**	**Case Presentations**	

***All topics subject to change**

EXPERIENTIAL GROUPS

Sign up for experiential groups will occur during Week 1 Class
5 Experiential Times-each student picks one time

Experiential Group Times are as follows:
Experiential Observations During the Following Weeks (4 hour each observation)
Week of 1/16-1/20
Week of 1/22-1/27
Week of 1/30-2/3
Week of 2/6-2/10
Week of 2/13-2/17

Refer to Blackboard for sign up version

Day	Time	Student	Email
Tuesday	1-5:00 OP	1	1
Group 1		2	2
Tuesday	8-12:00	1	1
Group 2		2	2
Tuesday	8-12:00	1	1
Group 3		2	2
Wednesday	730-1130	1	1
Group 4		2	2
Wednesday	8:00-12:00	1	1
Group 5		2	2
Wednesday	8-12:00	1	1
Group 6		2	2
Wednesday	8:00-12:00	1	1
Group 7		2	2
Thursday	730-1130	1	1
Group 8		2	2
Thursday	8:00-12:00	1	1
Group 9		2	2
Thursday	8-12:00	1	1
Group 10		2	2
Thursday	8-12:00	1	1
Group 11		2	2
Friday	8-12:00	1	1
Group 12		2	2

PARKING

- Parking is limited. PLEASE consider carpooling. We will be able to validate for parking.
- Other Parking Options
    - There is some parking on the street below the hospital near Roxbury Park or Beverly Hills High School
    - Parking in surrounding streets (time limits—so please read the signs)
    - Parking in Westfield Century City Mall (a little bit of a walk)
- Uber or Lyft

- California Rehabilitation Institute
  2070 Century Park East
  Los Angeles, CA 90067
  P: (424) 522-7100

Class Location: 2070 Century Park East, Century City, California 90067 1st floor Therapy staff area
First class, I will meet you in the lobby.

READINGS AND ADDITIONAL RESOURCES:

Alex M, wunsche BC, Lottridge D (2021). Virtual reality art-making for stroke rehabilitation: Field study and technology probe. *International Journal of Human Computer Studies*, Vol 145. https://doi.org/10.1016/j.ijhcs.2020.102481

American Occupational Therapy Association. (2020). Occupational therapy practice framework: Domain and process (4th ed.). *American Journal of Occupational Therapy, 74*(Suppl. 2), 7412410010. https://doi.org/10.5014/ajot.2020.74S2001

Baker, L., Wederich, C., McNeal, D., Newsam, C., & Waters, R. (2000). *Neuro Muscular Electrical Stimulation: A Practical Guide*, 4th edition. Downey: Los Amigos Research & Education Institute, Inc.

Bass-Haugen, J., Mathiowitz, V., & Flinn, N. (2008). Optimizing motor behavior using the occupational therapy task-oriented approach. In Radomski, M. V. & Latham, C. A. T. (Eds.), *Occupational Therapy for Physical Dysfunction*, 6th edition, (pp. 598-617). Philadelphia: Lippincott Williams & Wilkins.

Bender, L. Y McKenna, K. (2001). Hemiplegic shoulder pain: Defining the problem and its management. *Disability and Rehabilitation, 23,* 698-705.

Borg-Stein, J., & Simons, D. G. (2002). Myofascial pain. *Archives of Physical Medicine and Rehabilitation, 83 Suppl 1:* S40-7.

Chen ZJ, Gu MH, He C, Xiong CH, Zu J and Huang XL (2021). Robot-assisted arm training in stroke individuals with unilateral spatial neglect: A pilot study. Frontiers Neurol. https://doi.org/10.3389/fneur.2021.691444

Dieruf, K., Poole, J. L., Gregory, C., Rodriguez, E. J., Spizman, C. (2005). Comparative effectiveness of the givmohr sling in subjects with flaccid upper limbs on subluxation through radiologic analysis. *Archives of Physical Medicine and Rehabilitation, 86*: 2324-2329.

Duncan, P. W., D. K. Weiner, et al. (1990). "Functional reach: a new clinical measure of balance." J Gerontol 45(6): M192-197.

Dobkin, B. H. (2005). Rehabilitation after stroke. *The New England Journal of Medicine, 352(16)*, 1677-1684.

Dromerick, A.W., Lang, C.E., Birkenmeier, R., Hahn, M.G., Sahrmann, S.A., & Edwards, D.F. (2006). Relationships between upper-limb functional limitation and self-reported disability 3 months after stroke. *Journal of Rehabilitation Research & Development,* Vol 43(3): 401-408. http://www.ebrsr.com/evidence-review

Faria-Fortini I, Michaelsen SM, et al. (2011). Upper extremity function in stroke subjects: relationships between the International Classification of Functioning, Disability, and Health domains. J Hand Ther;24:257-65.

Ezendam D, Bongers RM, & Jannink MJA (2009). Systematic review of the effectiveness of mirror therapy in upper extremity function. *Disability and Rehabilitation*, 31(26): 2135-2149.

Gladstone, D. J., Danells, C. J., & Black, S. E. (2002). The Fugl-Meyer assessment of motor recovery after stroke: A critical review of its measurement properties. *Neurorehabilitation and Neural Repair, 16(3)*. 233-240.

Goldstein, B. (2004). Shoulder anatomy and biomechanics. *Physical Medicine and Rehabilitation Clinics of North America, 15*: 313-349.

Gorman SL, Harro CC, Platko C, and Greenwald C (2014). Examining the function in sitting test for validity, responsiveness, and minimal clinically important difference in inpatient rehabilitation. Archives of Physical Medicine and Rehabilitation, 95: 2304-2311.

Gorman SL, Rivera M, and McCarthy L (2014). Reliability of the function in sitting test (FIST). Rehabilitation Research and Practice. Hindawi Publishing Corporation. http://dx.doi.org/10.1155/2014/593280.

Gustafsson L, Walter A, Bower K, Slaughter A, & Hoyle M (2014). Single-case design evaluation of compression therapy for edema of the stroke-affected hand. The American Journal of Occupational Therapy, Vol 68 (2): 203-211.

Hardwick RM, Rajan VA, Bastian AJ, Krakauer JQ, and Celnik, PA (2017). Motor learning in Stroke: Trained patients are not equal to untrained patients with less impairment. *Neurorehabilitation and Neural Repai*r, 31(2): 178-189.

Harris JE, Eng JJ, Miller WC, and Dawson AS (2009). A self-administered graded repetitive arm supplementary program (GRASP) improves arm function during inpatient stroke rehabilitation. *Stroke*, 4: 2123-2128.

Hatem SM, Saussez G, Faille Md, Prist V, Zhang X, Dispa D, and Bleyenheuft Y (2016). Rehabilitation of motor function after stroke: A multiple systematic review focused on techniques to stimulate upper extremity recovery. Frontiers in Human Neuroscience. 10: 442. doi: 10.3389/fnhum.2016.00442.

Hayner KA (2012). Effectiveness of the California tri-pull method for shoulder subluxation poststroke: A single-subject ABA design. *American Journal of Occupational Therapy*, 66, 727-736.

Hsieh C.L., Sheu C.F., Hsueh I.P., & Wang C.H. (2002). Trunk control as an early predictor of comprehensive activities of daily living function in stroke patients. *Stroke. 33(11):*2626-30.

Hsu, HY, Chiu, HY, Kuan TS, Tsai CL, Su FC, and K LC (2019). Robotic-assisted therapy with bilateral practice improves task and motor performance in the upper extremities of chronic stroke patients: A randomized controlled trial. *Australian Occupational Therapy Journal*, 66, 637-647.

Jackson, D., Turner-Stokes, L., Khatoon, A., Stern, H., Knight, L. & O'Connell, A. (2002). Development of an integrated care pathway for the management of hemiplegic shoulder pain. *Disability and Rehabilitation, 24,* 390-398.

Jaraczewska E & Lang C (2006). Kinesio®Taping in stroke: Improving functional use of the upper extremity in hemiplegia. Topics Stroke Rehabilitation, 13(3): 31-42.

Katz-Leurer, M., I. Fisher, et al. (2009). "Reliability and validity of the modified functional reach test at the sub-acute stage post-stroke." Disabil Rehabil 31(3): 243-248.

Kwakkel G, Kollen BJ, & Krebs HI (2008). Effects of robot-assisted therapy on upper limb recovery after stroke: A systematic review. *Neurorehabilitation Neural Repair*, 22 (2): 111-121.

Law M, Baptiste S, McColl M, Opzoomer A, Polatajko H, & Pollock N (1990). The Canadian Occupational Performance Measure: An outcome measure for occupational therapy. *Canadian Journal of Occupational Therapy*, Vol 57 (2): 82-87.

Langhammer, B. (2000). Bobath or motor relearning programme? A comparison of two different approaches of physiotherapy in stroke rehabilitation: a randomized controlled study. *Clinical Rehabilitation, 14*: 361-369.

Lo, AC, Guarino PD, Richards LG, Haselkorn JK, Wittenberg GF, Federman DG, Ringer RJ, Wagner TH, Krebs HI, Volpe BT, Bever CT, Bravata DM, Duncan PW, Corn BH, Maffucci AD, Nadeau SE, Conroy SS, Powell JM, Huang GD, and Peduzzi P (2010). Robot-assisted therapy for long-term upper-limb impairment after stroke. *The New England Journal of Medicine*, 362: 19: 1772-1783.

Lundy-Ekman, L. (2002). *Neuroscience: Fundamentals for Rehabilitation*. Chapter 9, pg. 169-217.

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