**Title and Focus of Activity:** Examination Case Study – Outcome Measure Selection

*Examination and Outcome Measurement*

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**Course Information:**

PT Management of Neuromuscular Conditions I; 3 credit hours; Year two, fall semester. Occurs after Neuroscience and another course covering motor learning and basic motor control concepts. Occurs concurrently with PT Management of Neuromuscular Conditions I Lab. This course introduces students to concepts underlying the physical therapy management of individuals with movement dysfunction secondary to acquired neuromuscular deficits (stroke, multiple sclerosis, Parkinson’s, and brain injury). The initial segment of this course covers the examination of patients.

**Learning Experience Description**:

Following a lecture on selecting outcome measures, students work in small groups to complete the Examination Case Study – Outcome Measure Selection assignment.

The goal of this assignment is to identify appropriate outcome measures across the International Classification of Functioning, Disability, and Health (ICF) domains for a patient with a neurologic condition.

1. Students are divided into groups of six by the course instructor. Each group is issued one of four patient (paper) case studies (Maybelline, Carlos, Deb, or William).
	1. Each group is then sub-divided into three pairs; each pair is assigned an ICF domain: body function/structure, activity, or participation.
	2. *Students work in their pair (or triplet) for this assignment, but communicate with other pairs in the group.*
2. Read your assigned patient case study.
3. For your assigned ICF domain, select at least one construct of importance to the patient (e.g., motor function for body function/structure, gait for activity, or quality of life for participation). Use the APTA Neurology Section Outcome Measure Recommendations and/or Rehabilitation Measures Database to identify two or three outcome measures that might be appropriate for use with your patient to measure this particular construct.
	1. Because some measures include items pertaining to multiple constructs (body function and activity), the three pairs need to communicate with one another to assure that more than one pair does not select a given measure. In other words, the measures selected by one pair needs to be distinct from that selected by others in the group, measuring different constructs (e.g., balance and quality of life) or measuring a given construct in different ways (e.g., use of a self-report and a performance-based measure of balance).
4. Review the selected outcome measures, using the resources below and original scientific literature, and complete the written assignment (see the Examination Case Questions) pertaining to that measure.
	1. Each pair will submit their assignment for a grade.
5. An in-class discussion will focus on the clinical decision-making related to the selection of outcome measures for each patient case. Each pair must be prepared for an interactive discussion.

General guidelines and Helpful Tips:

1. To maximize the learning for each pair, avoid the divide and conquer approach.
2. Read the case study and questions carefully.
3. When composing your answers to the case study questions provide in-depth responses to explain your clinical reasoning. Relate your answers to your patient to help explain why this measure is likely to be useful.
4. The case report must be complete and content must be well organized. The report must be grammatically correct. Case reports that do not meet these criteria may be subject to point deductions.
5. The written case report is due at the time of the in-class discussion as identified on the syllabus.
6. Each pair submits one paper for a grade.
7. Cite sources using AMA format.

Case Study Questions: (See cases later in learning activity)

1. Which outcome measure did you select for your patient (i.e., what is the name of the measure that is the focus of your graded assignment?). (1 point)
2. For your selected measure, identify the domain(s) of the ICF (e.g., body function/structure, activity) and specific construct(s) assessed (e.g., muscle tone, balance, gait, and/or quality of life). (4 points)
3. What psychometric data exists to support the use of your selected measure for your particular patient? Be specific (e.g., state inter-rater reliability coefficients, sensitivity/specificity values, MDC/MCID). How does this information inform your clinical decision-making? Focus on those psychometric properties most important to your clinical decision-making, but be specific and thorough (e.g., if a MDC value is published, how does this assist you?). If there is a lack of psychometric data in your patient population, discuss the appropriateness of generalizing the psychometric data from studies in other populations to your patient. (15 points)
4. Consider the clinical utility of the outcome measure. Discuss the value of the measure for your particular patient given his/her current clinical status, prognosis, goals, etc… Also, discuss the feasibility of using the measure in the given clinical setting (e.g., IP rehab, out-patient clinic, or home). When doing so, you may make assumptions about space and equipment availability, providing these are reasonable given the case. (15 points)
5. Why did you select this particular measure and not the others that you considered to measure the domain(s)/construct(s) of interest? When answering this question, provide the full name/title of the other measures you considered and compare/contrast your selected measure to the others you considered for your patient. Focus only on those measures you considered to assess the same domain(s)/construct(s) of interest. (10 points)

Time for student to complete the activity:

1. preparation for activity outside of/before class: Students have approximately 3 weeks to complete the assignment.
2. class time completion of the activity: None -- students are expected to complete this outside of class.

Readings/other preparatory materials:

1. Prior to this assignment, a lecture provides students with foundational information important to making good clinical decisions regarding outcome measure selection.

2. Students also complete an in-class activity where they explore online outcome measure resources including the APTA Neurology Section EDGE Recommendations (<http://neuropt.org/professional-resources/neurology-section-outcome-measures-recommendations>) and the Rehabilitation Measures Database (<http://www.rehabmeasures.org/default.aspx>).

3. Potter K, Fulk G, Salem Y, Sullivan JE. Outcome measures in neurological physical therapy practice: Part I: Making sound decisions. *JNPT.* 2011;35(2):57-64.

It is expected that students will refer to and use various resources when completing the case study assignment. These include, but are not limited to:

1. APTA Neurology Section Outcome Measure Recommendations: <http://neuropt.org/professional-resources/neurology-section-outcome-measures-recommendations>
2. Rehabilitation Measures Database: <http://www.rehabmeasures.org/default.aspx>
3. PTNow: <http://www.ptnow.org/ClinicalTools/Tests.aspx>
4. Scientific literature

Learning Objectives:

1. Effectively use available online resources to gather information on outcome measures for patients with neurologic conditions
2. Compare and contrast various outcome measures in regards to psychometrics and clinical utility,
3. Select an appropriate outcome measure for a patient with a neurologic condition
4. Provide a sound rationale for clinical decisions related to selecting an outcome measure for a patient with a neurologic condition

**Patient Name/Age/Gender:** Maybelline, a 76 y.o. African-American female

**Reason for referral**: evaluate and treat

**Medical Diagnosis/ Health Condition**: R MCA stroke

**Subjective Examination/ Patient Interview:**

Current History: Maybelline is a 76 y.o. who sustained a right MCA stroke 4 days ago. She was admitted to St Luke’s hospital at the time of the stroke and was treated with tPA. She was admitted to in-patient rehab yesterday. The stroke resulted in dense left hemiplegia, left neglect, and left homonymous hemianopsia. She is unable to ambulate and she sustained one fall while in acute care when attempting to get out of bed. The fall resulted in some bruising of the L buttock but no other injury.

Past Medical History: HTN, Type II DM, mild pre-morbid dementia (decreased short-term memory), mild OA (hips, knees, fingers), and incontinence.

Current Level of Function:

**Mobility**: Patient requires mod to max assist for all mobility skills. Has not yet ambulated. Does not know how to use a wheelchair. Requires mod A for basic ADLs (eating, brushing teeth).

**24 hour Symptom Behavior**: Report of soreness on L buttock. Rated as 3/10.

Patient Goals: Return to home and previous level of function (ambulatory without device in home; able to drive).

Review of Medical Record

 General Health:

Malaise: No

 Chills/ Sweats/ Fever: No

Unexplained Weight Loss/ Gain: No

 Cardiovascular/ Hematological

 Fatigue/ Weakness: Yes

 Leg cramping: No

Dizziness/ lightheadedness: No.

 Pulmonary: No Coughing

Musculoskeletal: Weakness Noted

Joint integrity: Hypermobility noted L UE.

 Neurological: Paresthesia/ Numbness: Yes (L UE/LE)

Integumentary: Skin changes: No

Gastrointestinal: Bowel or bladder: Incontinent of urine at times.

Nausea: No

Metabolic: Diabetes: Yes

 Radiograph: B hip/pelvis radiographs show mild OA, but no evidence of fracture.

Environmental Factors: Patient lives in a 2nd floor apartment in a duplex with her daughter and 17 y.o. grandson. Daughter works two jobs totaling about 50 – 60 hours/week. 3 steps to enter building and 12 steps to apartment (railing on R when ascending on both sets of stairs).

Maybelline Case Continued:

Participation (Job, Family, Community): Patient is widowed. Husband of 56 years died earlier this year, at which time the patient moved in with her daughter. Some depression since the death of her husband (per daughter). Prior to the death of her husband, she was active in her church. Patient has a strong religious faith (Baptist).

Personal Factors (Medications, Nutrition, Physical Activity/ Exercise Routine, Sleep):

### Medications: Propranolol 60 mg/bid; Metformin 500 mg/bid. Patient was treated with tPA at the time of the stroke.

### Nutrition: Patient’s daughter reports that her mother is not consistent with following her diabetic diet.

### Exercise/Activity: Patient is reportedly sedentary (per daughter).

### Sleep: Reports not sleeping well.

Insurance: Medicare. No supplemental insurance.

The patient is a former smoker (35 pack year history). Does not drink alcohol.

**Objective Examination - Tests and Measures**

Body Structure and Function Impairments

**Cardiovascular/ Hematological**

**Auscultation**: Normal.

 **Vital signs:** resting HR 90 bpm, BP 132/88 mmHg (in sitting), RR 14 bpm

**Musculoskeletal**

**ROM**: WFL PROM.

**Strength/ MMT**: Strength generally 4/5 on R UE / LE. L LE grossly 1-2/5; UE 0-1/5.

**Neurological**:

**Arousal, Attention, & Cognition:** Alert & oriented to person. Knows she is in the hospital, but is uncertain which one. Oriented to month/year, but not specific date. Some evidence of short-term memory problems: during exam, asked about d/c plan 3x.

**Perception:** L neglect with L homonymous hemianopsia.

**Motor Function:** Impaired L UE/LE (diminished tactile discrimination, proprioception).

**Reflex Integrity:** Diminished tone and DTRs in L UE/LE.

**Sensation:**  Impaired L UE/LE.

**Integumentary:**

 **Anthropometric Characteristics:** Normal

**Skin Condition:** Normal.

Activity Limitations:

**Mobility**: Requires assistance for all mobility skills.

**Patient Name/Age/Gender:** Carlos, a 45 y.o. male

**Reason for referral**: evaluate and treat

**Medical Diagnosis/ Health Condition**: L ACA and MCA stroke

**Subjective Examination/ Patient Interview:**

Current History: Carlos is a 45 y.o. who sustained a left ACA & MCA stroke (hemorrhagic origin) 4 weeks ago. He spent 10 days in acute care followed by in-patient rehab at St. Luke’s where he received PT, OT, and speech therapy. He was recently discharged to home and is now receiving OP PT, OT, and Speech at the Rehab Institute of Kansas City. The stroke resulted in right hemiplegia and aphasia.

Past Medical History: poorly controlled HTN.

Current Level of Function:

**Mobility**: Patient is able to ambulate with SBQC and R AFO. Requires assist in the community.

**Speech/Language:** Patient has a significant non-fluent aphasia. Able to speak only the word “unt” but is able to follow commands well and communicates fairly well by gesturing and using communication board. Patient is able to use head nodding to answer “yes/no” questions.

**24 hour Symptom Behavior**: Gestures to indicate he has some R shoulder pain (appears intermittent).

Patient Goals: Unable to assess due to speech impairment. Patient’s roommate attended PT and indicated that the patient is very motivated to get better.

Review of Medical Record

 General Health:

Malaise: No

 Chills/ Sweats/ Fever: No

Unexplained Weight Loss/ Gain: No

 Cardiovascular/ Hematological

 Fatigue/ Weakness: Yes

 Leg cramping: No

Dizziness/ lightheadedness: No.

 Pulmonary: Coughing: No

Musculoskeletal

Weakness: Yes

 Joint integrity: Diminished R shoulder and elbow, and R ankle.

 Neurological

Paresthesia/ Numbness: Difficult to formally assess due to speech impairment, but patient indicates no numbness.

Integumentary Skin changes: Mild edema R hand. No trophic changes noted.

Gastrointestinal Bowel or bladder: No issues; Nausea: No

Metabolic: Diabetes: No

Environmental Factors: Patient lives in a first floor apartment with several other individuals (communal living environment). The apartment has 2 steps to enter with B railings. Patient was an artist prior to his stroke (made jewelry and other art pieces).

Participation (Job, Family, Community): Patient is single. Has a former girlfriend who lives in the area and is providing some support; he also has support of roommates.

Personal Factors (Medications, Nutrition, Physical Activity/ Exercise Routine, Sleep):

### Language: Patient is originally from Brazil. Was previously fluent in Spanish, Portuguese, and English.

### Medications: Vasotec 20 mg/qd. Baclofen 20mg/qd.

### Nutrition: Patient has been prescribed a low salt, low fat diet.

### Exercise/Activity: Patient does not engage in formal exercise.

### Sleep: No reports of difficulties.

Insurance: Medicaid.

The patient does not smoke or drink alcohol.

**Objective Examination - Tests and Measures**

Body Structure and Function Impairments

**Cardiovascular/ Hematological**

**Auscultation**: Normal.

**Vital signs:** resting HR 84 bpm, BP 128/84 mmHg (in sitting), RR 13 bpm

**Musculoskeletal**

**ROM**: Some limitations of PROM R shoulder and ankle. Otherwise WFL PROM.

**Strength/ MMT**: Strength generally 4/5 on L UE / LE. Weak R UE/LE.

**Neurological**:

**Arousal, Attention, & Cognition:** Unable to assess due to speech impairments. Patient is alert and able to follow 2-3 step commands.

**Perception:** No apparent impairments.

**Motor Function:** Impaired R UE/LE.

**Reflex Integrity:** Increased tone and DTRs in R UE/LE.

**Sensation:**  Appears intact.

**Integumentary:**

 **Anthropometric Characteristics:** Mild edema R hand.

**Skin Condition:** Normal.

Activity Limitations:

**Mobility**: Generally supervision for basic mobility with some deviations. Some assistance needed for higher level mobility skills.

**Patient Name/Age/Gender:** Deb, a 46 y.o. female

**Reason for referral**: evaluate and treat

**Medical Diagnosis/ Health Condition**: Multiple Sclerosis

**Subjective Examination/ Patient Interview:**

Current History: Deb is a 46 y.o. female with a 19 year history of MS. Deb’s disease was originally classified as relapsing-remitting, but has transitioned into secondary progressive. Deb was referred to OP PT due to increasing difficulties walking. She has sustained several falls in the home environment and has limited community ambulation ability.

Past Medical History: Crohn’s disease.

Current Level of Function:

**Mobility**: Patient is able to ambulate with contact guard on level indoor surfaces. At home, walks independently, using RW or furniture for support. Requires assist in the community. Limited endurance.

**24 hour Symptom Behavior**: Fatigue progresses throughout the day.

Patient Goals: Be able to walk safely without falling.

Review of Medical Record

 General Health:

Malaise: No

 Chills/ Sweats/ Fever: No

Unexplained Weight Loss/ Gain: No

 Cardiovascular/ Hematological

 Fatigue/ Weakness: Yes

 Leg cramping: No

Dizziness/ lightheadedness: No.

 Pulmonary: Coughing: No

Musculoskeletal

Weakness: Yes

 Joint integrity: No

 Neurological

Paresthesia/ Numbness: Occasional tingling reported in LEs. Otherwise WNL for light touch and proprioception.

Integumentary Skin changes: No

Gastrointestinal Bowel or bladder: Occasional urinary urgency; Nausea: No

Metabolic: Diabetes: No

Environmental Factors: Patient lives in a first floor apartment with her husband. The apartment has 1 step to enter with L railing (when ascending).

Participation (Job, Family, Community): Patient is a former teacher’s aide. Now on disability due to MS. Limited community involvement. Very supportive husband; they have two grown children who live out of state.

Personal Factors (Medications, Nutrition, Physical Activity/ Exercise Routine, Sleep):

### Language: English speaking.

### Medications: Occasional steroids used for Crohn’s disease (not taking any currently). Patient does report improved MS symptoms when taking steroids. Avonex 30 mcg injected one time/week. Ampyra 10 mg bid.

### Nutrition: No restrictions.

### Exercise/Activity: Patient does not engage in formal exercise. Reports limited activity due to mobility difficulties and fatigue.

### Sleep: No reports of difficulties.

Insurance: Medicaid.

The patient is does not smoke. Alcohol use: 1 drink (wine or beer) on occasion.

**Objective Examination - Tests and Measures**

Body Structure and Function Impairments

**Cardiovascular/ Hematological**

**Auscultation**: Normal.

 **Vital signs:** resting HR 78 bpm, BP 126/84 mmHg (in sitting), RR 13 bpm

**Musculoskeletal**

**ROM**: WFL PROM.

**Strength/ MMT**: Strength generally 4/5 in UEs. LEs as follows:

\*Unable to test gastrocnemius in standard position due to imbalance; tested in sitting

|  |  |  |
| --- | --- | --- |
|  | LEFT | RIGHT |
| Iliopsoas | 4 | 4 |
| Gluteus maximus | 3+ | 3+ |
| Gluteus medius | 3+ | 3+ |
| Quadriceps | 4 | 4 |
| Hamstrings | 3+ | 3+ |
| Tibialis anterior | 4 | 4 |
| Gastrocnemius\* | WFL | WFL |
| Peroneals | 3+ | 3+ |

**Neurological**:

**Arousal, Attention, & Cognition:** Alert and oriented x3. Reports some short-term memory loss (frequently looks to husband when answering questions).

**Perception:** No apparent impairments.

**Motor Function:** Impaired R UE/LE.

**Reflex Integrity:** Increased tone and DTRs in R UE/LE.

**Sensation:**  Intact light touch and proprioception.

**Integumentary:**

 **Anthropometric Characteristics:** WNL. **Skin Condition:** Normal.

Activity Limitations:

**Mobility**: Sit to/from stand with supervision to contact guard. Contact guard for 100’ ambulation on level indoor surfaces without device; with RW, able to ambulate with close supervision. Requires railing and contact guard to ambulate up/down 4 stairs. Moderate to severe ataxia noted with wide BOS, uneven steps, frequent stopping to re-gain balance.

**Patient Name/Age/Gender:** William, a 76 y.o. male

**Reason for referral**: evaluate and treat

**Medical Diagnosis/ Health Condition**: Parkinson’s disease

**Subjective Examination/ Patient Interview:**

Current History: William is a 76 y.o. male with a 9 year history of Parkinson’s disease. William was referred to OP PT due to increasing difficulties walking and imbalance. He has sustained a few falls in the home environment.

Past Medical History: OA in B knees.

Current Level of Function:

**Mobility**: Patient is able to ambulate independently on level indoor surfaces with some gait deviations. He has limited community access primarily due to embarrassment (due to drooling and other PD-related symptoms).

**24 hour Symptom Behavior**: Knee stiffness and occasional pain, most often noticed in the morning. Relieved by NSAIDs and movement. Patient also notes stiffness of his trunk.

Patient Goals: Does not specify any goals. His wife wants the patient to be able to walk with better posture. She wants to slow progression of his Parkinson’s symptoms.

Review of Medical Record

 General Health:

Malaise: No

 Chills/ Sweats/ Fever: No

Unexplained Weight Loss/ Gain: No

 Cardiovascular/ Hematological

 Fatigue/ Weakness: No

 Leg cramping: No

Dizziness/ lightheadedness: No

 Pulmonary: Coughing: No

Musculoskeletal

Weakness: No

 Joint integrity: Diminished in trunk and hips.

Neurological: Paresthesia/ Numbness: No

Integumentary Skin changes: No

Gastrointestinal Bowel or bladder: No issues; Nausea: No

Metabolic: Diabetes: No

Environmental Factors: Patient lives with his wife. The home is a first floor apartment in an independent living facility for elders. Meals and recreational activities are provided in a nearby building (3-5 minute walk).

Participation (Job, Family, Community): Patient is a retired dentist. Limited community involvement. The independent living facility has recreational programs (e.g., exercise classes, including Tai-Chi and aquatics, bingo, parties), but the patient doesn’t participate. Very supportive wife and three grown children (five grandkids) live in the state.

Personal Factors (Medications, Nutrition, Physical Activity/ Exercise Routine, Sleep):

### Language: English speaking.

### Medications: Patient on Sinemet CR x 8 years (currently taking Sinemet CR tid for total of 800 mg).

### Nutrition: No restrictions.

### Exercise/Activity: Patient does not engage in formal exercise. His wife reports limited activity.

### Sleep: No reports of difficulties.

Insurance: Medicare plus a supplemental.

The patient does not smoke or drink alcohol.

**Objective Examination - Tests and Measures**

Body Structure and Function Impairments

**Cardiovascular/ Hematological**

**Auscultation**: Normal.

 **Vital signs:** resting HR 90 bpm, BP 136/88 mmHg (in sitting), RR 15 bpm

**Musculoskeletal**

**ROM**: Limited trunk extension and rotation. Hip extension -10 degrees B.

**Strength/ MMT**: Strength generally 4-5/5 all extremities.

**Neurological**:

**Arousal, Attention, & Cognition:** Alert and oriented x3. Patient responds slightly slowly to commands and questions at times (slowed cognitive thinking).

**Perception:** WNL

**Motor Function:** Grossly intact coordination. Note resting tremor of UEs.

**Reflex Integrity:** Increased rigidity of trunk (with rotation) and LEs.

**Sensation:**  Intact light touch and proprioception.

**Integumentary:**

 **Anthropometric Characteristics:** WNL.

**Skin Condition:** Normal.

Activity Limitations:

**Mobility**: Unable to lie prone. Mild difficulty and increased time to complete supine to sit. Sit to/from stand with use of UEs independently; min A without UE use. Able to ambulate independently on level indoor surfaces with gait deviations. Note increased gait deviations and imbalance when walking in dual task condition. Requires railing and contact guard to ambulate up/down 6 stairs.

Methods of evaluation of student learning:

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Criteria/Weight\* | Score | Comments |
| 1. Selected outcome measure | [ ]  Measure identified – 1[ ]  Measure not identified -- 0 |  |  |
| 2. ICF domain and constructs identified | [ ]  Correct ICF domain and construct(s) correctly identified – 4[ ]  ICF domain and construct(s) identified but not completely correct – 2[ ]  No ICF domain or construct(s) identified -- 0 |  |  |
| 3. Psychometric data to support selection | [ ]  Relevant psychometrics are considered and discussed as related to clinical decision-making; if appropriate, issues of generalizability from other populations are discussed and correct -- 15[ ]  Relevant psychometrics are discussed, but the explanation related to decision-making is incomplete or incorrect--10 [ ]  Psychometrics are discussed, but inappropriate or of limited value to the patient case and the relationship to decision-making is incomplete or incorrect-- 5[ ]  Answer provided does not discuss the psychometric data -- 0 |  |  |
| 4. Clinical utility | [ ]  The value of the selected measure for the patient and the clinical setting are provided, thorough, and appropriate – 15[ ]  One of the above criteria (value to patient or setting) is met, but not both -- 10[ ]  Information is provided regarding the value of the measure to the patient and setting, but is incomplete and incorrect -- 5[ ]  Answer provided does not address the value of the measure for the patient or setting -- 0 |  |  |
| 5. Rationale for selection of particular outcome measure |  [ ]  All measures considered for the domain(s)/construct(s) of interest are identified, a relevant comparison is provided, and a clear rationale for the selection of the given measure is stated -- 10[ ]  Two of the three criteria noted above are met -- 5[ ]  None of the above criteria noted above are met -- 0 |  |  |

\*Partial credit (i.e., scores in-between two ratings) may be issued.