Knowledge Translation: Developing Evidence-Based Clinicians in Home Care

Speaker(s): Matt Janes, PT, DPT, MHS, OCS, CSCS
Derek Nordman, MPT, ATC
Laurie Otis, PT, MBA, MHA, GCS, COS-C
Patricia Scheets, PT, DPT, MHS, NCS

Session Type: Educational Sessions
Session Level: Multiple Level

This information is the property of the author(s) and should not be copied or otherwise used without the express written permission of the author(s).
Knowledge Translation: Developing Evidence-Based Clinicians in Home Care

Matt Janes, PT, DPT, MHS, OCS, CSCS
Derek Nordman, PT, MPT, ATC
Laurie Otis, PT, MBA, MHA, GCS, COS-C
Patty Scheets, PT, DPT, MHS, NCS

Disclosure

• Matt Janes - No relevant financial relationship exists
• Derek Nordman - No relevant financial relationship exists
• Laurie Otis - No relevant financial relationship exists
• Patty Scheets - No relevant financial relationship exists

Objectives

• At the end of this section, the participant will:
  – Understand the systematic approach of KT applied in the initiative and the intent of accelerating optimal use of the best available research evidence
  – Describe rehabilitation as a means for developing skill in home health practice
  – Describe evidence-based task-specific training principles
  – Apply observational analysis during the patient examination when identifying the cause of the patient’s activity limitations
  – Recognize the value of using standardized tests in clinical practice
  – Identify strategies to increase intensity of a treatment session in order to maximize progress

Company

• Gentiva Health Services
• 40 States
• Greater than 200 locations nationwide
• Over 350,000 patients served/year
• Over 2500 therapy clinicians
• Proprietary Specialty offerings
• Oversight by Rehab Director

The Need

• Not unlike most Home Health Agencies – “Do more with less.”
• Efficiency and Consistency in clinical care
• Increase the utilization of EBP
  – Evaluation
  – Activity and Participation Limitation Identification (by task specific practice)
  – Proper Intensity of the Intervention
  – Leading to proper documentation of patient progress and outcome
  – Pre-training clinical documentation review conducted within 5 branches to allow post-training analysis.

The Aim

Support and re-energize our therapy field leaders and clinicians by delivering immediate updates to specialty content and clinical skills based on latest science, in a way that allow for immediate adoption into practice.
The Formula

• Five questions to be answered as posed by Grimshaw et al
  1. What knowledge should be transferred?
  2. To whom should the research knowledge be transferred?
  3. By whom should the knowledge be transferred?
  4. How should the knowledge be transferred?
  5. With what effect should knowledge be transferred?

What knowledge should be transferred?

• Evidence Based Best Practice
  • Skilled Examination and Evaluation
  • Task Specific Practice
  • Intervention Intensity
  • Documentation

To whom should the research knowledge be transferred?

• Direct to consumer!
  – Alternative to “Train the Trainer”
  1. Clinical Leaders
     (Branches with Rehab Director oversight)
  2. Direct to Clinician

By whom should the knowledge be transferred?

• Company Experts (controlled consistency)
  o Matt Janes, PT, DPT, MHS, OCS, CSCS
  o Laurie Otis, PT, MBA, MHA, GCS, COS-C
  o Patty Scheets, PT, DPT, NCS
  o Jennifer Ellis, PT, DPT, MS, GCS, COS-C
  – Did allow secondary trainings at the clinician level via
    Directors of Clinical Operations and Rehab Directors

How should the knowledge be transferred?

• Stakeholder Buy-in
• Virtual Classroom
• Bite size doses
• Over a 5 month period (June through September)
• Knowledge checks modules (virtual feedback/response)
• Application learning – Mini “Labs”
• Clinical Support Tool “Gentiva Therapy Guide”
• Recorded Sessions for availability
  – Module 1 – 2758
  – Module 2 – 2441
  – Module 3 – 2146
• Post-training follow up

With what effect should knowledge be transferred?

• Behavior Change
  – Adoption of Evaluative Testing
  – Activity and Participation Limitation Identification
    (by task specific practice)
  – Inclusion of Intensity Validation
  – Post training documentation analysis
Skill Acquisition

Consistency
- Performance over multiple trials

Flexibility
- Performance under a variety of conditions

Efficiency
- Performance with a certain level of energy expenditure

Task-Specific Training Defined
- What is a Task?
  - Space between Body Structure/Function and Activity
    - Body Structure/Function = muscle performance, timing, and balance
    - Activity = walking from the living room to the kitchen for dinner and returning to the living room
- What is Task-Specific Training?
  - Goal directed
  - Coordinated movements and/or sustained postures
  - Replicate some component of daily activities
  - Aim towards reconstruction of the whole activity
  - Reinforced with positive and timely feedback

ICF Model
Common language and nomenclature for functioning, disability and health (WHO)
Task Specific Training Continuum

<table>
<thead>
<tr>
<th>Task Space</th>
<th>Activity Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stair Tap</td>
<td>Walk down steps and transfer into senior citizens’ van</td>
</tr>
<tr>
<td>Containers and Lids</td>
<td>UB grooming and dressing</td>
</tr>
</tbody>
</table>

Principle - Task Selection

- **Task Selection**
  - Applicable to the Patient
  - Goal Directed
  - Sufficient Challenge

- **Meaning and Fit**
  - Targeted to Impairment

Principle - Task Delivery

- **Task Delivery**
  - Set the Task Parameters
  - Tasks Need to Be Practiced
  - Focus on the desired impairment
  - Remediation or Compensation
  - Monitor Response
  - Progress the Challenge

Sit to Stand

- Task used in wide range of activities
- Task demands:
  - Force production at initiation
  - Control of inter-segmental movement and shifting COM during execution
  - Ability to stabilize in a new position at termination

Sit to stand patient profiles

- **Cardiopulmonary - CHF**
  - Task Parameters
  - Task: Raise seat height to diminish demand on skeletal muscle; Repeated trials
  - Borg RPE; Total min tolerated; Vitals; Dyspnea level

- **Musculoskeletal - Spinal Stenosis with Functional Decline**
  - Task Parameters
  - Task: Strengthening Paradigm
  - Borg RPE; Time to Complete; Timed; Pain

- **Neuromuscular - DM with Peripheral Neuropathy**
  - Task Parameters
  - Task: Compliant surface to increase balance demand
  - Task: 2-3 trials interspersed w/other activities (balance paradigm)
  - X LOB; BoS; Time to Complete; Timed

Task Specific options

- **Sit to Stand**
- **Cardiopulmonary Demand**
- **Musculoskeletal Demand**
- **Neuromuscular Demand**
Group Question - Sit to Stand Task

Musculoskeletal
• TKA – Quad weakness
• Strength Demand
• Remediation

1. Which phase of the task has the greatest strength demand?
2. What surface height is most appropriate to encourage quad recruitment, High Medium or Low?
3. Will you allow UE support, Yes or No?
4. What will you monitor?
5. How will you progress the task?

Task - Stair Tap

• Preparation for obstacle negotiation, stairs, and change of direction during ambulation
• Task demands:
  – Stance limb: force production (isometric) of extensors and balance
  – Swing limb: force production of hip flexors and timing to place foot on step

Patient Profile – Stair Tap

Cardiopulmonary - CHF
• Cardiopulmonary Demand
• Task Set Up
  • Adjust step height; Alternate sides
  • Duration focus

Musculoskeletal - Functional Decline with Spinal Stenosis
• Posture and Timing Demand
• Task Set Up
  • Adjust step height; Fewer repetitions
  • Cues for trunk stabilization
  • Sit between sets

Neuromuscular - DM with Peripheral Neuropathy
• Balance and Timing Demand
• Task Set Up
  • Alternate sides; compliant surface
  • Cues for postural correction

More LE Task Ideas

Tandem Balance: Step Up / Up; Down / Down

Step Over

Step Up / Up: Down / Down

UE Tasks

• Variability in what we do with our hands
  – Reach
  – Grasp
  – Move or manipulate
  – Release
• What is realistic for the patient’s ability given their impairment
  – Grade task so that it takes 8-15 s

TASK - Object Transport

• Element common across many ADL/IADLs
• Task demands:
  – ROM and strength proximally (including trunk)
  – Isolated movement distally
  – Cardiopulmonary demand with repeated UE movement
  – Problem solving
Patient Profile – Object Transport

Cardiopulmonary - CHF
- Cardio Demand
- Task Set Up
  - Weight of object; Movement height
  - Unilateral or Bilateral; Repeated Trials

Musculoskeletal – Functional Decline with Spinal Stenosis
- Posture Demand
- Task Set Up
  - UE Movement Pattern
  - Weight of object; Trunk position

Neuromuscular – DM with Peripheral Neuropathy
- Balance and Timing Demand
- Task Set Up
  - Compliant surface
  - Movement speed; COM displacement

Overall Considerations for Task Specific Training
- Progress the challenge based on desired outcome
- Monitor response to treatment in a single session and across sessions
- Identify overall progress towards functionally based goals using objective measures

Making it Work for YOU in Your Practice
- Adopt a new routine
  1. Rehabilitation is about skill acquisition
     - Maximize consistency, flexibility and efficiency
  2. Make Task-Specific Training your priority intervention
     - Differentiate what you do in treatment from the home program
  3. Develop a new task that fits with your patient’s specific needs

Take a Closer Look
Patty Scheets, PT, DPT, MHS, NCS

The Therapist’s Clinical Examination

Standardized Measures
- Baseline data for scoring
- Interpretative comments from observational analysis

- TUG
  - Sit → stand; Turn to change direction
- BERG
  - Stair tap; Pick object up from the floor
- SPPB
  - Sit → stand; Standing balance progression

Health Status
- Systems Review
- Drug Regimen Review

Impairment Tests
- Body Functions and Structures

Observational Analysis
- Qualitative Analysis

Standardized Measures
- Quantitative Analysis
Observational Analysis

Systematic Observation
- Kinematic analysis
- Changes in joint angles and limb displacement
- Timing, range of motion, speed, inter-segmental relationships

Phases
- Initiation, Execution, Termination

Each Joint
- Proximal to distal

Which Tasks to Observe?
- Varying Demands
- Demands can be Generalized to other Tasks
- Sufficient Challenge
- Overlap with Items on Standardized Tests
- Recommendation
  - Quiet Sitting, Quiet Standing (EO/EC), STS, Stair Tap, Walking, Walking with Head Turning, Step Over, Change Direction, Reach, Grasp

Which Tasks to Observe?

Sit to Stand

Initiation Execution Termination

Identifying Faulty Movement Performance

Sit to Stand Example

KT - Janes, Nordman, Otis, Scheets
Cardiopulmonary Patient Example

Musculoskeletal Patient Example

Cardiopulmonary Patient Documentation

Musculoskeletal Patient Documentation
Neuromuscular Patient

Neuromuscular Patient Example

Neuromuscular Patient Documentation

Making it Work for YOU

• Adopt a new routine
  – Be thorough in your systems review
    • Complete the OASIS
    • Drug regimen review
  – Do a complete examination
    • Baseline status
    • Understand the nature of the patient’s problem
    • Be specific in your observations
  – Develop a specific plan of care

Treatment Ideas

Bring it On!

Matt Janes, PT, DPT, MHS, OCS, CSCS

KT - Janes, Nordman, Otis, Scheets
Tests and Measures

- A standardized test or measure promotes reliability and validity through the procedures of administering, scoring and interpreting results in a consistent and predetermined standard

- Tests and measures are used as a measure of a patient’s progress or relative outcome

Short Physical Performance Battery (SPPB)

- Measures:
  - Functional status
  - Physical performance
  - Focus on Lower Extremities

- High correlation:
  - Mobility disability
  - Hospitalization
  - Institutionalization
  - Mortality

2 Minute Walk Test (2MWT)

- 2 minute walk test (2MWT)
- Correlation:
  - function, morbidity, and mortality
- MDC90 (older adults) = 15 meters or 49.2 feet
- Equipment:
  - Stopwatch or second hand
  - Tape measure
  - BP cuff
  - Chair

Standardized Tests and Measures

- Short Physical Performance Battery (SPPB)
- 2 Minute Walk Test (2MWT)
- Borg Scale (Rating of Perceived Exertion (RPE))
- Dyspnea Scale (Rating of Perceived Exertion (RPE))

Perceived Exertion

- Perception
- Perceived Exertion
- Physical work capacity
- Physiological variables
- Physiology

Performance
Exercise and Activity Prescription

- Progressive age related loss of strength
  - 1% to 5% loss of strength each year after 30
  - 3% to 5% loss of strength each year after 60
- Loss of strength = loss of function
- Effective strength practice

Exercise and Activity Prescription

<table>
<thead>
<tr>
<th>Modified Scale</th>
<th>Ordinal Borg RPE Scale</th>
<th>Percent Effort</th>
<th>Perceived Work Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0%</td>
<td>Minimal</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>10%</td>
<td>Very light</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>20%</td>
<td>Fairly light</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>30%</td>
<td>Moderately light</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>40%</td>
<td>Light</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>50%</td>
<td>Very light</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>60%</td>
<td>Fairly light</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>70%</td>
<td>Moderately light</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>80%</td>
<td>Light</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>90%</td>
<td>Very light</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>100%</td>
<td>Maximal</td>
</tr>
</tbody>
</table>

Exercise and Activity Prescription

- Maximum Heart Rate (Max HR) = 220 – age
  - 155 Max HR = 220 – 65
- Target Heart Rate (THR) = Percentage of Max HR
  - 93 THR = 155 (60%)
- Heart Rate Reserve (HRR) = Max HR – Resting HR
  - 85 HRR = 155 – 70
- Target Heart Rate Range (THRR) = (Max HR – Resting HR) x % Intensity + Resting HR
  - A = [(155 – 70) x 60%] + 70 and B = [(155 – 70) x 80%] + 70
  - 121 – 138 THRR
Exercise and Activity Prescription

Building UE Strength

Vital Sign Baseline Normative Values

American Heart Association (AHA) Standards

- Blood Pressure (BP): Systolic 90-140 mmHg
  Diastolic 60-90 mmHg
- Heart Rate (HR): 60-90 beats per minute (bpm)
- Respirations (R): 12-16 breaths per minute
- Oxygen Saturation (O2 Sat): ≥ 90%

Vital Sign Response to Exercise

<table>
<thead>
<tr>
<th>VITAL SIGN RESPONSE GUIDELINES</th>
<th>NORMAL</th>
<th>HIGH</th>
<th>VERY HIGH</th>
<th>EMERGENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP</td>
<td>100-140</td>
<td>141-180</td>
<td>≥ 181</td>
<td>≥ 220</td>
</tr>
<tr>
<td>DBP</td>
<td>90-140</td>
<td>141-180</td>
<td>≥ 181</td>
<td>≥ 220</td>
</tr>
<tr>
<td>Heart Rate</td>
<td>60-90</td>
<td>91-100</td>
<td>≥ 101</td>
<td>≥ 120</td>
</tr>
<tr>
<td>Heart Rhythm</td>
<td>Normal</td>
<td>Regular Sinus</td>
<td>Arrhythmia with non-dropped beats or regular baseline</td>
<td>Arrhythmia with dropped or irregular rhythms</td>
</tr>
</tbody>
</table>
| Therapist Response             | Safe to begin exercise | Avoid vigorous exercise | Encourage compliance with medication, check pulse, and report to MD if patient call MD, arrange for office visit or ED visit immediately if patient develops symptoms possibly caused by medication
Normal Blood Pressure Response to Exercise

### Systolic Pressure
- Increases with increasing workload
- Flattens out/decreases slightly as maximum work capacity is reached

### Diastolic Pressure
- Demonstrates no change and/or
- Slightly increases or decrease

Abnormal Blood Pressure Response to Exercise

### Systolic Pressure
- Demonstrates little or no response with increasing workload.
- Slight fall, then rise with increased workload,
- Normal rise which abruptly falls

### Diastolic Pressure
- Increases with increasing workload and/or increase is prolonged after exercise is stopped

Building Activity Tolerance

**PT Documentation Example**

**ACTIVITY TOLERANCE:**
Tolerated: 20 minutes of continuous activity, 13 RPE
Required: 30 seconds, 30 minutes rest between bouts
Crucial activity intensity, response and recovery:
Patient able to tolerate 20 minutes of continuous activity with minimal rest periods between each designated bout. Patient performed 10 repetitions each set of bilateral LE hip abduction, adduction, flexion and extension in standing with and without UE support using Red TheraBand. Patient reported Borg level of 11 mid activity. Performed R, L, and alternating UE overhead reaching activity with mil kg weighted to 2.5 pounds x 10 reps each set. Performed set to stand x 10 reps and alternating step lap exercises x 3 minutes then step up/down x 3 minutes until Borg rating of 13 achieved. Assessed post BF: 140/96, HR 120 and RRR 22. Patient appeared mildly fatigued at end of treatment session but was able to recover and return to baseline parameters within 5 minutes post activity.

Indications for Termination of Exercise

- Chest pain of any type
- Severe shortness of breath
- Dizziness or faintness
- New onset or increase in mental confusion
- Sudden onset of sweating, pallor, cyanosis
- Sign of irregular heart rhythm
- Patient request to stop
- Drop in systolic BP > than 10 mmHg from baseline, despite increase in workload
- O2 saturation 85-89% & symptomatic, absolute cutoff is 85%
- Hypertensive response
- Systolic blood pressure > 210 mmHg and/or
- Diastolic blood pressure >115 mmHg
- Leg cramps or increase in leg pain
- Fatigue, shortness of breath, increased wheezing

Bring it on!

- **Adopt a new routine**
  - Utilize tests and measures for examining exertional ability and functional performance
  - Prescribe a level of optimal intensity appropriate for your patient
  - Develop a plan of care that promotes functional activity tolerance and independence
  - Monitor response to exercise and activity

Bring it on!
Knowledge-to-Action Process

Outcomes

Measures of clinician empowerment, engagement, support, “energy” and adoption into practice

- Number of OT and PT staff who completed training
  - Target: ≥ 50% of target audience
  - Result: average attendance across all 3 modules 67.7%
  - 2966 employees completed one or more of the modules
  - “I feel I will be able to apply this information to my practice.”
  - Target: ≥ 70% Agree or Strongly Agree
  - Result: average across all 3 modules 89.8%

Chart Audit Results

Convenience Sample
- 4 therapists from each region
- Reviewed 5 completed records prior to training and 5 completed records after training
- 16 behaviors associated with the first 3 modules
- Calculated an adherence score for each record; averaged for each clinician
  - Possible adherence scores range from 1.0 to 0.0

Home Health Section

Platform Presentation

Friday, February 6
3:00 – 5:00 pm
- 3:20 – 3:40 pm

Opportunities

- Present < 50% of the time after training
  - A 2-minute walk test was completed during the Physical Therapist’s evaluation
  - Strength training was implemented using an intensity of at least 60% of a 1-repetition maximum identified using the Borg RPE scale to identify the intensity
  - An RPE rating was provided for at least 1 activity from the Physical Therapist’s evaluation
  - Sessions are of appropriate duration and intensity (using Borg or HR) to build CP capacity if documented as a problem
  - Standardized tests are used when reporting progress

Additional Opportunities

- Increase prevalence of task-specific training in post-operative cases
- Progress strength training by adding resistance (intensity) rather than adding repetitions
- Summarize progress in terms of skill consistency, flexibility, and efficiency rather than advancement of exercises
- Do more gait speed training rather than gait endurance training
Strengthen of the KT Project

- Recognized need company-wide
  - Therapist engagement
  - Therapy practice
- Re-stabilization in company structure
  - Therapist in senior leadership
  - Local structure for therapy support determined
- Operational support for training
  - Wanted to see behavior change
  - Trust in the product to be produced
- Senior leadership support
  - Resource allocation
- Enthusiasm among local therapy leaders
- Available technology and technological expertise
- The “Therapy Guide”

Limitations of the KT Project

- Short timeline for development
- Inexperience with virtual classroom for clinical teaching
- Activities to reinforce learning were optional
  - Few local leaders implemented follow-up activities
- Competing priorities
  - EMR

Sustainability

- Modules made available for CEUs
- Reinforced concepts and use of “Therapy Guide” in other projects
- Intermittent chart audits
  - RPE ratings more consistently used now

Summary of Key Points

- Large scale KT Intervention
- Training converted theoretical constructs to concrete behaviors
- Clinicians did change behavior
- Organization support critical
- Competing priorities are a factor
- Consistent clinical message with lasting clinical support tools increases likelihood of sustaining change
Selected References


Selected References con’t.


Selected References con’t.


Selected References con’t.

## Observational Task Analysis Practice

### Sit to Stand Analysis – Patient 1

<table>
<thead>
<tr>
<th>Overall</th>
<th>Initiation</th>
<th>Execution</th>
<th>Termination</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Unable to assume normal starting position; stiffness</td>
<td>□ Increased base of support</td>
<td>□ Decreased weight bearing</td>
<td>□ Posterior sway</td>
</tr>
<tr>
<td>□ Absent preparatory movements</td>
<td>□ Posterior displacement of trunk relative to hips in sitting</td>
<td>□ Shifts center of mass to one side</td>
<td>□ Steps</td>
</tr>
<tr>
<td>□ Unable to modify movement strategy with cues/practice</td>
<td>□ Insufficient force production</td>
<td>□ Shifts COM to one side or back; resists correction</td>
<td>□ Shifts COM to one side</td>
</tr>
<tr>
<td>□ Improves performance with cues/practice</td>
<td></td>
<td>□ Medial hip rotation/hip adduction</td>
<td>□ Shifts COM to one side or back; resists correction</td>
</tr>
<tr>
<td>□ Fatigues with repetition</td>
<td></td>
<td>□ Extends knees before hips in first half</td>
<td>□ Unable to shift COM forward to find balance</td>
</tr>
</tbody>
</table>

- Increased base of support
- Posterior displacement of trunk relative to hips in sitting
- Insufficient force production
- Decreased weight bearing
- Shifts center of mass to one side
- Shifts COM to one side or back; resists correction
- Medial hip rotation/hip adduction
- Extends knees before hips in first half
- Insufficient anterior translation of tibia over foot
- Pushes on thighs to extend trunk
- Valgus of knee
- Varus of knee
- Excessive pronation of foot
- Supination of foot

### Stand to Sit Analysis – Patient 1

| | Initiation | Execution | Termination |
| | □ Initiates with posterior sway | □ Inadequate control of descent into chair | □ Multiple starts when changing BOS or initiating movement |
| | □ Insufficient knee flexion on initiation and during execution | □ Inadequate hip/knee extension during WB | □ Insufficient hip/knee extension on swing limb for stair touching |
| | □ Insufficient hip flexion during execution | □ Improves performance with cues/practice | □ Loss of balance; steps to recover |

- Initiates with posterior sway
- Insufficient knee flexion on initiation and during execution
- Insufficient hip flexion during execution
- Inadequate control of descent into chair
- Inadequate hip/knee extension during WB
- Insufficient hip flexion on swing limb for stair touching
- Loss of balance; steps to recover

### Standing Postural Control Analysis – Patient 2 (Cardiopulmonary)

| | Initiation | Execution | Termination |
| | □ Structural alignment faults (scoliosis, kyphosis, etc.) | □ Multiple starts when changing BOS or initiating movement | □ Shifts COM to one side |
| | □ Prefers wide base of support | □ Insufficient hip/knee extension during WB | □ Shifts COM to one side |
| | □ Increased sway | □ Insufficient hip flexion on swing limb for stair touching | □ Shifts COM to one side or back |
| | □ Increased sway with eyes closed | □ Loss of balance; needs to be caught to prevent a fall | □ Shifts COM to one side or back; resists correction |
| | □ Aversion to eyes closed condition | □ Unable to modify movement strategy with cues/practice | □ Unable to modify movement strategy with cues/practice |
| | □ UE guarding or reaching | □ Movement strategy improves with cues/practice | □ Movement strategy improves with cues/practice |
| | □ COM shifted left, right, or back | □ Fatigues with repetition | □ Fatigues with repetition |
| | □ Shifts COM away from midline; resists correction | | |
| | □ Hesitation when changing BOS or initiating movement | | |

- Structural alignment faults (scoliosis, kyphosis, etc.)
- Prefers wide base of support
- Increased sway
- Increased sway with eyes closed
- Aversion to eyes closed condition
- UE guarding or reaching
- COM shifted left, right, or back
- Shifts COM away from midline; resists correction
- Hesitation when changing BOS or initiating movement
- Multiple starts when changing BOS or initiating movement
- Insufficient hip/knee extension during WB
- Insufficient hip flexion on swing limb for stair touching
- Loss of balance; steps to recover
- Loss of balance; needs to be caught to prevent a fall
- Unable to modify movement strategy with cues/practice
- Movement strategy improves with cues/practice
- Fatigues with repetition
<table>
<thead>
<tr>
<th>Standing Postural Control Analysis – Patient 3 (Musculoskeletal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Structural alignment faults (scoliosis, kyphosis, etc.)</td>
</tr>
<tr>
<td>☐ Prefers wide base of support</td>
</tr>
<tr>
<td>☐ Increased sway</td>
</tr>
<tr>
<td>☐ Increased sway with eyes closed</td>
</tr>
<tr>
<td>☐ Aversion to eyes closed condition</td>
</tr>
<tr>
<td>☐ UE guarding or reaching</td>
</tr>
<tr>
<td>☐ COM shifted left, right, or back</td>
</tr>
<tr>
<td>☐ Shifts COM away from midline; resists correction</td>
</tr>
<tr>
<td>☐ Hesitation when changing BOS or initiating movement</td>
</tr>
<tr>
<td>☐ Multiple starts when changing BOS or initiating movement</td>
</tr>
<tr>
<td>☐ Insufficient hip/knee extension during WB</td>
</tr>
<tr>
<td>☐ Insufficient hip flexion on swing limb for stair touching</td>
</tr>
<tr>
<td>☐ Loss of balance; steps to recover</td>
</tr>
<tr>
<td>☐ Loss of balance; needs to be caught to prevent a fall</td>
</tr>
<tr>
<td>☐ Unable to modify movement strategy with cues/practice</td>
</tr>
<tr>
<td>☐ Movement strategy improves with cues/practice</td>
</tr>
<tr>
<td>☐ Fatigues with repetition</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standing Postural Control Analysis – Patient 4 (Neuromuscular)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Structural alignment faults (scoliosis, kyphosis, etc.)</td>
</tr>
<tr>
<td>☐ Prefers wide base of support</td>
</tr>
<tr>
<td>☐ Increased sway</td>
</tr>
<tr>
<td>☐ Increased sway with eyes closed</td>
</tr>
<tr>
<td>☐ Aversion to eyes closed condition</td>
</tr>
<tr>
<td>☐ UE guarding or reaching</td>
</tr>
<tr>
<td>☐ COM shifted left, right, or back</td>
</tr>
<tr>
<td>☐ Shifts COM away from midline; resists correction</td>
</tr>
<tr>
<td>☐ Hesitation when changing BOS or initiating movement</td>
</tr>
<tr>
<td>☐ Movement strategy improves with cues/practice</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

|                                                                 |
|                                                                 |

[2]