**Title and Focus of Activity:** Guillain Barre Syndrome: Jigsaw Case *Patient/Client Management*

**Contributor(s):** Laura Plummer, PT, MS, DPT, NCS, lplummer@mghihp.edu; Anne McCarthy Jacobson, PT, DPT, MS MGH Institute of Health Professions, School of Health and Rehabilitation Sciences, Physical Therapy Department

**Course Information:** Clinical Management of Neuromuscular Disorders-I. 6 credits; Fall year 2. Students have learned the pathophysiology of GBS and have had exposure to acute care and cardiopulmonary content in their first year.

**Learning Experience Description:** This jigsaw learning activity focuses on patient/client management from the acute to more chronic phases of recovery of Guillain Barre Syndrome (GBS). In a jigsaw case, students work on one segment of a case to become “experts” in that segment. They are joined with “experts” from other segments of the case and are asked to “teach” their portion and learn from others. The learning occurs in a case divided into four parts based on episodes of care in different settings (intensive care, acute care, inpatient rehabilitation and outpatient physical therapy).

The initial part of the case is the acute phase involving admission to the hospital and transfer to the intensive care unit for worsening of symptoms. The students prepare this portion prior to class and engage in a large group (grossly 70 students) discussion based on the 4 guiding questions (see Appendix A). Students are organized (prior to class) into groups of about six students (identified by color and care setting) and subgroups of 7-8 students (identified by letter). There are four groups of 5-6 students who work on the acute care portion, four groups of 5-6 students who work on the inpatient rehabilitation portion and four groups of 5-6 students who work on the outpatient portion in parallel. Each group is only given the portion of the case for the episode of care that they have been assigned. The lab instructors are given the whole case. If students have questions about the patient’s disease course that they can ask the lab instructors as they would ask a patient in an interview and the lab instructor will answer as if they are the patient. Two lab instructors are assigned to the each set of 4 groups for a given episode of care (acute, inpatient rehabilitation or OP).

Each part of the case has questions that the group needs to come to consensus on regarding examination, prognosis or plan of care. The students are encouraged to find evidence to support their decisions and rationales. After an hour, students then move into their previously assigned subgroups. For example, 2-3 students in Group 1 Acute will now meet with 2-3 students from Group 5 inpatient rehabilitation and Group 9 outpatient. When this occurs, the groups size expands to about 7-8 students with representatives from each of the case episodes of care. The subgroups now have students who have worked on the acute portion, rehab portion and outpatient portion episode of cares. The groups are given time (in parallel) to “teach” each other what they learned in their original groups in order to follow the patient through the continuum of care. Finally the class comes back together and discusses their answers to the more challenging higher level thinking questions (highlighted in yellow on attached case) and debrief regarding any other questions that arose during the class time.

Timing of activities:

9:00-9:30 AM Large group discussion regarding Part 1 of Bob case

9:30-10:30 AM Meet in small groups based on setting (acute 1-4 blue, inpatient rehabilitation 5-8 green, outpatient yellow 9-12).

10:30-11:15 AM Meet in groups based on number and letter

 Group 1,5,9 A (group 1 acute, group 5 inpatient rehabilitation, and 9 outpatient)

 Group 1,5,9,B

 Group 2,6,10 A

 Group 2,6,10 B

 Group 3,7,11 A

Group 3,7,11 B

Group 4,8,12 A

Group 4,8,12 B

11:15-11:45 AM- Large Group Discussion regarding the answers to the questions for the various portions of the case in order to make sure that the various groups have come to consensus on the physical therapy management of the client and understand key concepts in managing a patient with GBS.

Time for student to complete the activity: 1. preparation for activity outside of/before class: 3 hours preparation for reading materials and preparation of part 1 of case 2. class time completion of the activity: 3 hours of in class time

Readings/other preparatory materials: 1. Powerpoint presentation on Guillain Barre Syndrome created by professors 2. First portion of case from admission through ICU stay 3. Chapter 17, pp.554-570.Umphred DA. *Neurological Rehabilitation*, 6th ed., CV Elsevier, 2013. **Recommended reading**: 1. Van den Berg B, Walgaard C, Drenthen J et al. Guillain-Barre syndrome: pathogenesis, diagnosis, treatment and prognosis. *Nat Rev Neurol*. 2014;10:469-482. 2.Fisher T, Stevens JE. Rehabilitation of a marathon runner with Guillain-Barre Syndrome. *JNPT*. 2008;32:203-209.

Learning Objectives: 1. Describe pathophysiology and typical course of disease process of Guillian Barre Syndrome (GBS). 2. Discuss how to prioritize and proceed with examination of a patient with GBS at various points in the recovery process through a patient case. 3. Develop a plan of care for a patient with GBS at various points in the recovery process utilizing a patient case. 4. Discuss principles of overwork and considerations for developing therapeutic exercise programs for patients with GBS at various points in the recovery process using a patient case. 5. Analyze evidence to formulate rationales for plan of care for a patient case.

Methods of evaluation of student learning: Patient management concepts and GBS content are evaluated formally as part of the final exam for PT students. The questions on the exam are cased based multiple choice and case based short answer focusing on the course of the disease, prognosis, intervention and concepts of potential for overwork.

**Appendix A Guillain Barre Syndrome Case**

**PRE CLASS portion of case:**

Bob is a 36 year old male who developed muscle soreness and then tingling in his toes and feet 1 week prior to admission. He was admitted to the hospital on 12/2/12 after a fall with complaints of progressive BLE weakness and progressive tingling from his toes to now lower legs. His medical chart reports that he had a respiratory illness 2 weeks prior to the onset of symptoms. The Neurology service suspected Guillain Barre Syndrome, and he was started on a 5 day course of intravenous immunoglobulin (IVIG) on admission. After admission he continued to have progressive weakness and was intubated on hospital day # 3 due to vital capacity (VC) < 20ml/kg. Physical therapy was consulted in the Neuro ICU after intubation (hospital day 4). He was on IVIG day 4/5. Bob looked uncomfortable and complained of pain (muscle aching) in his lower back and posterior thighs and in his toes and feet.

**Medications**: Neurontin 600 mg TID for pain, oxycodone 10 mg q 4 hrs prn, ambien for sleep prn, 5000 u heparin SC

**Ventilator Settings**: Fraction of inspired O2 (Fi02) 40%, Synchronized Intermittent Mandatory Ventilation (SIMV) 10, Positive End Expiratory Pressure (PEEP) +5, Respiratory Rate (RR) 12

**Past medical history**: none

**Relevant Medical Tests:**

Lumbar Puncture: increased total protein

CT Brain: no evidence of acute process

**Nerve Conduction Studies**: Impression: findings suggest demyelination as seen in GBS. Lower amplitudes may speak to early axonal disease. Recommend follow up in 2 weeks.

**ACUTE CARE:**

1. What do you want to consider or understand (e.g., interpretation of clinical data) further prior to initiating the examination?
2. What are your priorities for examination at this point in his disease process?
3. What factors that will influence how you proceed with your examination? What precautions will you take?
4. Describe your tests and measures.

**ACUTE CARE GROUP:**

He completed his 5 days of IVIG and started to demonstrate improving muscle performance. He was extubated successfully two days ago (hospital day 9). His pain has improved and he is receiving neurontin tid and tylenol as needed. He continues to be uncomfortable in posterior thighs and low back especially when lying flat at night. The nurse reports decreased blood pressure and complaints of dizziness when she raises the head of the bed.

History obtained from chart, patient and family interview

**Patient Identified Goals:**

**“**I want to be able to walk again, return to work and my normal life.”

**Personal Factors:**

Coping: anxious regarding current condition. Patient is worried about fiancé and prognosis. Needs frequent reassurance.

Prior level of function: I in ADLs/IADLS without a device

Social Supports: lives with fiancé, mother lives in area

Occupation: works full time as accountant, primarily desk job, concerned that he is entering tax season

Exercise: runs 3-5 miles 3-4 times per week, cycles in spring and summer

Leisure: enjoys hiking, reading

**Environment:**

Lives in 2nd floor apartment in South End, 4 steps with rail to enter building and 12-13 steps with rail to apartment. Once in the apartment all living areas on same floor.

Takes public transportation to work and walks 4-5 blocks from T stop to office.

**Systems Review:**

**Communication/Affect/Cognition**: alert, appears anxious, distracted due to pain, able to follow simple commands but fatigues easily,

**Integumentary System**: intact, small area of ecchymosis R lateral forearm/elbow and R knee (fiancé reports bruising is due to fall)

**Examination**

**Musculoskeletal System**

ROM: WNL throughout

Height 5’11” Weight 185

Muscle Strength: No active movement except:

|  |  |  |  |
| --- | --- | --- | --- |
| B Shoulder elevation | 2/5 | B Hip Flexion, abduction, and extension | 2-/5 |
| B Shoulder flexion | 2/5 | B knee extension | 2+/5 |
| B shoulder abduction | 2-/5 | B knee flexion | 2-/5 |
| B Elbow flexion | 2-/5 | B ankle dorsiflexion | 1/5 |
| B Elbow extension | 2/5 | B ankle plantarflexion | 2-/5 |
| B wrist flex/ext and grasp | 1/5 |  |  |

**Cranial Nerve/Vision Integrity:**

CNs intact. Denies blurriness, and diplopia

**Pain:**

Reports pain in low back and down B posterior thighs 7/10 which interferes with sleep.

**Sensory Integrity:**

Light touch: localizes stimulus throughout UEs, trunk and LEs, complains of paresthesias throughout UE and LE distal>proximal

Proprioception: absent B great toes, impaired B ankles, impaired B knees, intact at hips

**Ventilation/Gas Exchange:**

**Auscultation:** decreased aeration throughout with fine crackles at bases

**Pattern**: decreasedchest wall movement and inspiratory effort

**Cough:** ineffective, but cough triggered with suctioning and suctioned for clear secretions

**Aerobic Capacity/Endurance**

Rest: HR 100, BP 140/85, 02sats 98%, RR 12

With rolling side to side in bed and strength testing

HR 110-115, BP 150/85, 02sat 95%, RR 16-24

**Functional Mobility**

Bed mobility: Dependent

**ACUTE CARE:**

What are your priorities for intervention at this point?

How will you proceed with PT intervention? Think about prevention, remediation, compensation.

Bob wants to know if he will ever walk again. What will you say?

**INPATIENT REHABILITATION:**

Bob’s medical status has improved. He has transferred to inpatient rehabilitation Day 13.

Arousal, Attention and Cognition: A+O \*3, able to follow all commands. He is frustrated by his lack of mobility and strength

**Muscle Performance:**

|  |  |  |
| --- | --- | --- |
|  | **RIGHT** | **LEFT** |
| Shoulder Flex | 3/5 | 3/5 |
| Shoulder Abd | 3/5 | 3/5 |
| Elbow Flex/Ext | 3/5 | 3/5 |
| Wrist Flex/Ext | 3-/5 | 3-/5 |
| Grasp | 2/5 | 2/5 |
| Hip Flex | 3-/5 | 2/5 |
| Hip Ext | 3-/5 | 2/5 |
| Hip Abd  | 3-/5 | 2/5 |
| Knee ext | 3/5 | 3-/5 |
| Knee Flex | 3-/5 | 2/5 |
| Ankle DF | 2/5 | 2-/5 |
| Ankle PF | 2/5 | 2-/5 |

**ROM**: grossly WNL except DF to neutral B

**Sensory integrity**:

Proprioception: absent great toes, impaired ankles. Intact at knees and hips.

Light touch: Reports paresthesias in B hands and BLE at ankles and below.

Decreased vibration BLE below ankles.

**Motor Control**: decreased execution and termination of movement, decreased speed and accuracy of movement

**Bed mobility**: rolling independently to L with rail, mod A sidelying to sit-able to initiate movement but needs A to complete movement.

**Sitting balance**: able to sit in midline for 2 minutes with feet supported, but then needs BUE support due to fatigue

**Transfer from raised bed to chair**: mod A sit<---> stand with rolling walker; difficulty with transition to stand and sit due to decreased concentric and eccentric control.

**Aerobic Capacity/Endurance**:

**Vitals**:

Rest: HR 100 BP 120/70 02 sat 99%, RR 16

With transfer: HR 120 BP 144/78 02sat 95%, RR 24 RPE 13

**Ventilation**: clear to auscultation, decreased at B bases

Cough weak

Pattern: decreased lateral costal expansion B

**INPATIENT REHAB**:

What standardized test and measures would you consider to track progress over time in inpatient rehabilitation?

What would be the focus of your PT plan of care?

How would you work on strengthening at this point? What precautions do you need to keep in mind?

How would you monitor his program to ensure he is responding appropriately? How will you decide to progress or regress strengthening program?

When would you initiate gait training, and what is your rationale for this decision?

**OUTPATIENT PT:**

Bob has made significant progress. He is 15 months since onset of symptoms. He is married and has returned to work as accountant. He continues to have some dysesthesias in his fingers and toes. He was discharged from rehab with AFOs and wore them initially. With the help of his outpatient PT several months ago, he weaned from wearing them during his regular day and describes no issues with “foot slap” or tripping. If he goes for longer walks (> 4 miles), he notices that his feet slap and sometimes he trips. He also continues to be limited by fatigue especially after a long day at work and with leisure activities, but this resolves with rest.

 He is returning to outpatient PT as would like to return to hiking and running/jogging.

**Muscle performance**: 5/5 throughout except 4/5 B ankle DF and PF

**Sensory Integrity**:

Proprioception: intact B great toes, continued dysesthesias in finger and toes, describes as tingling

**OUTPATIENT**

Do you think Bob will return to running and hiking?

What additional tests and measures would help to determine this?

How would you proceed with your plan of care to help Bob achieve these goals?

How would you monitor his program to ensure he is responding appropriately? How will you decide to progress or regress strengthening program?