Strategies to Address Interprofessional Communication and Behaviors That Hinder Acute Care Practice

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Objectives
1. Describe the immediate and long-term physiological response to gravitational forces.
2. Articulate the complexities of hospital environment decision making by the physical therapist and physical therapist assistant.
3. Discuss the role of the physical therapist and physical therapist assistant in determination of patient disposition from the hospital.
4. Describe the comprehensive analysis used to determine a patient’s response to mobility.
5. Describe the potential outcome measures that are used to determine a patient’s readiness for hospital discharge.

“A hospital is no place to be sick.”
—Samuel Goldwyn

Clinical Reasoning

Diagnostic Reasoning
- Interaction
- Procedure
- Teaching
- Collaboration
- Prediction
- Ethics

Narrative Reasoning

Generation of Knowledge

Diagnosis, Prognosis, Interventions

Generation of Knowledge

Communication

Theoretical Model of Acute Care Practice

Edwards et al, 2004

Masley et al, 2011
What Makes Us Unique?
- Physiology and physiologic monitoring are the backbone of acute care practice
- Risk assessment of untoward events with exercise, rest and post discharge
- Prevention of comorbidities while inpatient
- Titration of exercise in light of known pathophysiology to facilitate healing that is adjusted in relation to the ongoing physiologic response

Massey et al, 2011; Gorman et al, 2010

What Makes Us Unique?
- Communication skills
  - Interprofessional communication
  - Patient/family/caregivers
  - As part of professional responsibility to all involved in patient’s care
  - Accountability
  - Safety
  - Acute PT scope of practice
  - Advocating on patient’s behalf

Massey et al, 2011; Gorman et al, 2010

How Frequent is Communication?

<table>
<thead>
<tr>
<th>Communication Frequency</th>
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<tbody>
<tr>
<td>Other Team Members</td>
<td>66.5% (1573)</td>
</tr>
<tr>
<td>Patients’ family or associates</td>
<td>16.2% (382)</td>
</tr>
<tr>
<td>Third-party payer</td>
<td>8.6% (203)</td>
</tr>
<tr>
<td>Other agency or facility</td>
<td>1% (24)</td>
</tr>
</tbody>
</table>

“It might be expected that communication is essential in a setting in which patients’ medical status may change from moment to moment, where patients may be moved from one level of care to another quite rapidly, and where length of stay is short.”

Jette et al, 2009

“Creative thinking should be viewed as an essential supplement to, though not a replacement for, critical thinking.”
---Lloyd P. Provost & R. M. Sprout

Case #1: Fannie
- 65 y/o female
- Stage IV endometrial CA
- PT consulted morning of DC date
  - Scheduled afternoon of DC
  - LOS was 10 days
- Bony mets suspected
  - “They are all over her pelvis”

Patient is “ready” for discharge
- Imaging
  - Suspicion of bony mets documented repeatedly throughout daily progress notes
- No new imaging noted
- Outside hospital imaging was reviewed by primary service
  - Results were only verbally discussed
- Labs
  - Alk phos levels markedly elevated
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“Just” see if she can walk
- Received patient dressed and awaiting transport for DC after ten day inpt stay.
- First comment, before hello, was, “Don’t make me stay here.”
- Lived with supportive family in a second floor apartment
- No previous use of an assistive device.
- Gait training with a rolling walker on level and performed family training for stairs
- Education on her bony risks

What to Consider Before She Walks
- What is her risk of injury with walking versus not walking?
- Since I don’t have imaging, I have to consider what I do know about her to determine those risks?
- Cancer type, location of metastases, overall strength
- What methods can I employ to keep her moving?

Osteoblastic vs Osteolytic Tumors
- Osteoblastic
  - Common with prostate, 15-30% chance with uterine, lung, colon, stomach and kidney.
  - Skeletal Related Events (SRE) Sequelae: Pain and pathologic fx’s
- Osteolytic
  - Common with breast CA and multiple myeloma
  - SRE Sequelae: Severe pain, pathologic fx’s, life threatening hypercalcemia, spinal cord compression

Osteoblastic vs Osteolytic Tumors
- Regardless of tumor type, most patients with bone metastases have evidence of both abnormal bone resorption and formation. Hence the risk of pathological fractures in both osteoblastic and osteoclastic lesions.

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Biochemical Markers for Bone Degradation

- Markers of bone resorption have high specificity but very low sensitivity due to measures are often of all isoenzymes. Elevation could mean liver, bone or other organ dysfunction. (Damers et al, 1995)
- Isoenzymes of Alkaline phosphatase (ALP) are specific to organs. The enzyme ALP is found in kidney, liver, bone, intestine and the placenta of pregnant women. (www.la testsonline.org)
- Bone-specific Alkaline phosphatase (ALP) is a biochemical marker of osteoblast activity along with osteocalcin and type-I procollagen C-propeptide. (Roodman)

Imaging

- Bone scan and PET scan: localize but do not identify all parameters that define bone integrity well
- Computed Tomogram: Can offer three-D imaging of bone
- Magnetic Resonance Imaging: bony edema, marrow involvement
- Radiographs: cannot detect a lesion until at least 50% of the bone is involved

Mirels’ Risk Stratification

Used to determine risk of fracturing

<table>
<thead>
<tr>
<th>Variable</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
<td>Upper limb</td>
</tr>
<tr>
<td>Pain</td>
<td>Mild</td>
</tr>
<tr>
<td>Lesion</td>
<td>Blastic</td>
</tr>
<tr>
<td>Size</td>
<td>&lt; 1/3</td>
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</tbody>
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What to do with the Mirels’ Score

- Recommendation for or against prophylactic fixation of a lesion based on overall score
- Prophylactic fixation is highly indicated for a lesion with score of 9 or greater
- Overall score of 7 or less can be managed using radiotherapy and drugs
- Overall score of 8 presents a clinical dilemma
- Probability of fracture is only 15%
- Mirels recommended the attending physician use clinical judgment in such cases and consider prophylactic fixation (Jawad)
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Can This Score Help Our Decision?
- Mac Niocaill’s research advocated the application of the radiological components of the Mirels’ scoring system as reliable and repeatable in their cohort of patients
- The pain subset was more difficult to support

One of a few mentions in the literature about weight bearing limitation as a treatment...
- The general indications for surgery in neoplastic acetabular lesions are:
  - Continued acute symptoms, despite appropriate management with restricted weight bearing, systemic therapy, and analgesics
  - Continued debilitating pain and poor function 1–3 months after radiation therapy to the lesion
  - A pathologic fracture of the acetabulum or ipsilateral femur
  - An impending fracture of the ipsilateral femur requiring surgery

What We Know About Bone Biomechanics
- Normal activity results in forces of compression, tension, and torsion
- Bone is weakest in torsion
- Even a small cortical defect can significantly reduce torsional strength
- A 6-mm drill hole in the cortex, such as that which is generated to obtain bone biopsy, reduces torsional strength by 50%
What We Know About Human Movement

- Bone strength is directionally dependent, anisotropic rather than isotropic
- Anisotropy = Directionally dependent
- Isotropy = Uniform properties in all directions
- Human movement happens in multiaxial patterns, putting bone at risk in variable directions at the same time with ADL’s
- Cannot control forces feasibly without external support

Clinical Reasoning

Diagnostic Reasoning
- Procedural Reasoning
  - Assistive device prescription & training
- Predictive Reasoning
  - Risk stratification
  - Impact of fatigue on risk of falling

Narrative Reasoning
- Interactive Reasoning
  - Pt upset, wanted to leave, saw PT as barrier to her plan to go home
- Collaborative Reasoning
  - If patient to be adherent, collaboration needed
- Reasoning about teaching
  - How best to educate patient AND team

What looked simple but wasn’t?

- Knowing the potential risk of skeletal related events with weight bearing
- Gait training and education on the importance of not just using pain as an indicator of need for walker use. Pain is an indicator of microfractures.
- Need for family assist on stairs and to limit use of stairs
- Weighing her prognosis versus limiting her activity level.

Case #2: Jacob

- 54 y/o Male
- s/p MI with fall, CABG X 2
- Blood pressure
  - At rest: 130s/70s; no sx
  - 40’ “walk”: 160s/80s; sx of DOE, fatigue, and pressure

He “just” needs to walk

- Refused his morning meds because he did not have a HA or chest pain. Nursing educated but pt continued to refuse.
  - Meds included: anti HTN, plavix, glucophage.
- Agreed to PT exam, concerned about how the pain from his fall would effect his movement.
- Educated patient about vascular graft integrity, myocardial need for diastole and need to accomplish much more with fewer sx post DC.
Principles of Oxygen Transport

Convection
- The movement of oxygen from the alveoli to the tissue capillaries and is determined primarily by hemoglobin concentration, oxygen saturation, and cardiac output.

Diffusion
- The movement of oxygen from the capillaries to the mitochondria and is determined by metabolic rate, vascular resistance, capillary recruitment, and tissue oxygen consumption and extraction.

Principles of Oxygen Transport

Exercise increases the diffusion of oxygen by increasing capillary dilation and recruitment. 
Increasing capillary dilation and decreases vascular resistance to flow. 
Decreased diffusion distance increases the amount of oxygen diffused and increases the oxygen tension in the cell.

Deficits in either or both of these can lead to impaired oxygen transport.
Vascular Changes Post CABG

- Microvascular alterations post CABG, characterized by a marked heterogeneity of perfusion reflected by the decreased proportion of perfused small vessels
- As in septic patients, the alterations were independent of global hemodynamic variables
- Distribution of perfusion is more critical for tissue oxygenation than total blood flow to the area because heterogeneity of perfusion is more poorly tolerated than a homogeneous decrease in organ perfusion

De Baker

Clinical Reasoning

Diagnostic Reasoning
- Procedural Reasoning
  - Pt needs to walk more, with less sx
  - Importance of ongoing, dynamic assessment

Narrative Reasoning
- Collaborative reasoning
  - Patient’s story about when & why to take medication
  - Adherence vs. compliance?
- Ethical reasoning
  - Benefits vs. risks?
  - Session vs. no session?
  - Session w/meds vs. session w/o meds?

Outcome

- Pt opted to take meds
  - Saw importance despite “not having a headache”
  - Nursing stated appreciation for concrete examples and gave meds
- Second session 1 hour later
  - walk 200’ & ascend 1 flight of stairs
  - 15 mmHg increase in systolic
  - 3 mmHg drop in diastolic
  - without dyspnea

What looked simple but wasn’t

- Knowing to check the BP response to exercise and correlate the signs to the symptoms; dyspnea measures can be helpful—not for him; concrete measures were vital
- Translating the relationship between exercise tolerance, surgery recovery and the role his meds can offer him
- Following through on a second session post meds

Case #3: James

- 49 y/o Male
- ESLD
- Bedrest for 10 days
- Hepatorenal Syndrome
- Lines that were thought to limit activity/ previously believed contraindications

You “just” sat at the edge of the bed?

- Sitting at EOB was the extent of his activity tolerance
  - vital sign response
  - symptoms
  - potential for exponential fatigue
- Response from nurse or physician
  - “Is that all that they did? He sat in the chair for three hours yesterday.”
### Hepatic Function
More than 500 exist, this is a sampling:
- Maintains blood glucose levels (glucose\(\rightarrow\)glycogen)
- Production of bile to break down fats in the small intestine
- Removes amino end of acids (ammonia) for production of urea
- Detoxifies chemicals
- Makes fibrinogen, prothrombin, albumin and some globulins
- Stores vitamins and iron
- Venous organ, acts as blood reservoir
- Excretes drugs and hormones

Key function to consider in relation to changes with aging

http://medicalcenter.osu.edu

### Renal Function
- Regulate osmolality of body fluids
- Regulate blood pressure, volume of blood and extracellular fluid by controlling excretion of sodium and water (RAAS)
- Regulates electrolyte concentration in the extracellular fluid.
- Play role in acid-base balance (bicarbonate)
- Eliminate metabolic waste products such as urea (end product of protein metabolism), uric acid (end product of purine metabolism), and creatinine (end product of muscle metabolism)
- Eliminate drugs and toxins
- Key function to consider in relation to the changes with aging
- Produce erythropoietin, renin, kallikrein, prostaglandins, thromboxane
- Metabolic functions: convert inactive Vitamin D to active, synthesize ammonia, synthesize glucose and help maintain blood glucose concentration when needed

### Pathophysiology that Impacts Oxygen Carrying Capacity
- Intravascular versus extravascular volume
- Edema, limiting oxygen accumulation in the peripheral tissues
- Potential of cirrhosis limiting venous capacitance of liver and ability to change cardiac output quickly with change in demand
- Impact of potential oxygen debt from prolonged time out of bed earlier
- Slowed VO\(_2\) kinetics in subjects on bedrest

### Oxygen Debt
- Argued as a reason for impaired function in patients with critical illness-limited research clearly draws a conclusion
- Woorons investigated the impact of lactate on exercise tolerance in situations of hypoventilation
- Diminished respiratory muscle strength with prolonged illness, edema and fatigue while OOB
- Prolonged position impacts third spacing

### Principles of Oxygen Transport and Impacts
- Diffusion depends on the
  - Quantity and rate of blood flow
  - Difference in capillary and tissue oxygen pressures
  - Capillary surface area
    - Prolonged postures impact capillary beds perfused
  - Capillary permeability
    - Diminished with increased osmotic pressure
  - Diffusion distance
    - Increased with edema

### Principles of Oxygen Transport Impacted by this Clinical Scenario
- Diffusion gradients throughout the body are essential for oxygen transport
- Pulmonary capillary to alveolar tissue to receive inspired oxygen
  - Can be impacted by pulmonary edema
- Peripheral capillaries to the tissues where mitochondria utilize oxygen to drive metabolism
- Deficits in either or both of these can lead to impaired oxygen transport
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Interdigitating Gears

Clinical Reasoning

Diagnostic Reasoning
- Procedural Reasoning
  - Type, duration, and intensity of activity

Narrative Reasoning
- Interactive Reasoning
  - Best approach to interprofessional interaction
- Reasoning about teaching
  - Interprofessional education about physiologic monitoring and relationship to activity tolerance
- Ethical reasoning
  - Risk of injury to patient (DTI, aggressive start to mobility)

Outcome
- Initiated standing with max assist
  - Tolerated 30, 60, 90 second bouts
- Progressed to exercise sessions with Moveo
- Resumed sitting in the bedside chair for one hour bouts
- Transferred to LTAC

What looked simple but wasn’t?
- Understanding how to define activity/exercise tolerance
- Understanding the change in oxygen transport pathway due to multiple physical and physiological changes
- Communicating with other professionals to design activity sessions throughout the day

Case #4: Mary
- 69 y/o Female
- s/p cervical ESI
- Admitted due to a balance impairment
- PT consult
  - Modified Berg Balance Scale
  - Modified DGI exam
  - Assistive device determination

Nursing can “just” get her up
- Energetic NA who is also a nursing student
- NA was asked by nursing to mobilize patients whenever possible
- NA encountered pt walking with PT and said, “I was just coming to get her walking.”
Clinical Reasoning

Diagnostic Reasoning
- Predictive Reasoning
- Fall risk identification

Narrative Reasoning
- Collaborative Reasoning
- This case, for the nursing staff
- Reasoning about teaching
- Student and NA open to learning from PT

Outcome
- Student was educated regarding need for balance testing and other neurological testing prior to walking away from a secure surface

Case #5: Lisa
- 63 y/o Female
- Comminuted tib fib x w/fix fix
- Post MVA waited 4 weeks for surgery due to edema
- w/level pre-op
- Bed height was too challenging for her to safely transfer and maintain NWB
- Planned to sleep on a chaise lounge lawn chair
- Previous PTs suggested home care
- Slow but steady progress with gait and hospital-scenario transfers
- True bed height was not known

Home care can “just” take care of it
- With all questioning, slow to answer and gave minimal answers
- Questioned her mental status & ability to care for herself
- Impact pain meds had on her safety
- With the challenge of transfers and ongoing discussion, began to cry
- When asked if she was in pain or overwhelmed she mentioned that her husband passed away about 1 month prior to her MVA
- Offered to consult med psych liaison nurse
- Informed floor nursing, case management and primary service of all events and consults

Clinical Management
- Called case manager to discuss options for discharge
  - Acute rehab was an option, PLOF prior to accident was independent
  - Due to 60% rule, transfer was delayed
  - Functional level improved sufficiently to dc home with a hospital bed
  - Son flew in from Denver 6 days earlier than planned

Clinical Reasoning

Diagnostic Reasoning
- Procedural Reasoning
- Complex transfer situation due to medical status and precautions
- Inability to simulate home situation

Narrative Reasoning
- Collaborative Reasoning
- Must take time to listen to patient’s story
- Interactive Reasoning
- Decisions about how to interact with patient
- Referrals
- Keeping team informed

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Outcome

- Patient comfortable with the plan to go home
- “You were my inspiration!”
- Take the time to develop a thorough discharge plan
- Never would have been appreciated in a group-cover all situations as close to home setting as possible
- Feasible in a gym setting where time between patients is brief and response to exercise after rest breaks can be appreciated
- Percolation of emotions over time

Discussion & Questions

“What is important is to keep learning, to enjoy challenge, and to tolerate ambiguity. In the end there are no certain answers.”

—Martina Horner
President, Radcliffe College

References


Questions? Thoughts?