Hospital Associated Functional Status Decline in Pulmonary Patients

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Learning Objectives

The learner will be able to:

- Describe those patient physical activities with the greatest impact on functional status outcomes for hospitalized COPD patients.

- Apply findings from the research presented to develop strategies to preserve functional status of hospitalized COPD patients.

- Disclosures: none

Problem

- Chronic obstructive pulmonary disease (COPD) patients are at increased risk for deconditioning during hospitalization, which can lead to decreased functional status at discharge

Significance

- Global burden of COPD

- COPD among the top admitting diagnoses in the U.S.

- Hospital Readmission Reduction Program (HRRP) for COPD

Significance

- Functional decline during hospitalization:

  immobility $\longrightarrow$ deconditioning

- Limited research mobility interventions

- Mobility interventions require nursing resources

Aims

- Examine the relationship between the number, type, and timing of patient out of bed activities and outcomes (length of stay, discharge to home, and 30 day readmission)

- Determine the differences between hospitalized older adults with COPD and hospitalized patients with other diagnoses

Hospital Associated Deconditioning Model for COPD
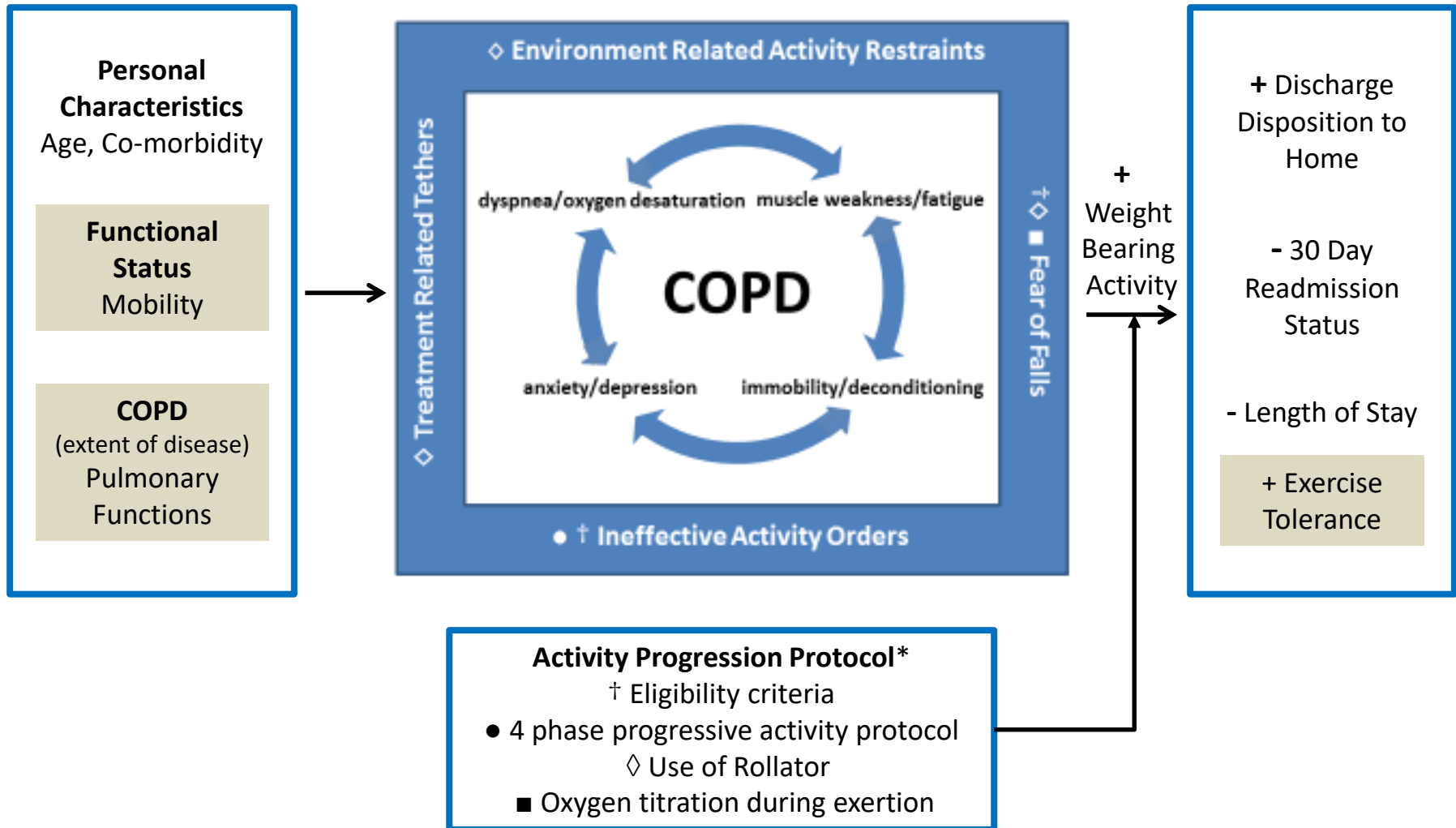
Assumptions of the Model

- Disease related factors make COPD patients vulnerable to deconditioning

- The hospital environment creates barriers to mobility

- Promoting weight bearing mobility improves functional outcomes at discharge

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Hospital Associated Deconditioning Model for COPD

Baseline Status

Hospitalization
Modifiable Barriers to Mobility

Functional Outcomes

Personal Characteristics
Age, Co-morbidity

Functional Status
Mobility

COPD
(extent of disease)
Pulmonary Functions

◊ Environment Related Activity Restraints

◊ Treatment Related Tethers

† ◊ ■ Fear of Falls

dyspnea/oxygen desaturation muscle weakness/fatigue

COPD

anxiety/depression immobility/deconditioning

● † Ineffective Activity Orders

+ Weight Bearing Activity

+ Discharge Disposition to Home

- 30 Day Readmission Status

- Length of Stay

+ Exercise Tolerance

Activity Progression Protocol*
† Eligibility criteria
● 4 phase progressive activity protocol
◊ Use of Rollator
■ Oxygen titration during exertion

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*Nurse-Administered Pulmonary Protocol Increases Out-of-Bed Activity, Shortens Length of Stay, and Reduces Readmission. (2009). Retrieved 6/1/17, 2017, https://innovations.ahrq.gov/profiles/nurse-administered-pulmonary-protocol-increases-out-bed-activity-shortens-length-stay-and

Hypotheses

- Increased out of bed weight bearing activity is associated with improved functional status outcomes.

- There is a difference between out of bed weight bearing activity among hospitalized older adults with COPD and patients with other diagnoses.

Methods

- Secondary data analysis
- COPD patients (n = 111)
- Non-COPD patients (n = 191)

- All patients admitted to a pulmonary unit
- Activity protocol designed to address mobility barriers related to COPD and hospitalization

Activity Progression Protocol

- Unit Based Protocol – nurse driven
- Screening criteria for neurological, hemodynamic and pulmonary stability
- Assessment guidelines for intolerance
- 4 levels of *progressive* activity
- OOB within 24 hours of admission
- Oxygen titration during exertion for saturation < 90%
- Use of Rollator

Nurse-administered pulmonary protocol increases out-of-bed activity, shortens length of stay, and reduces readmissions. Agency for Health Care Research and Quality: Health Care Innovations Exchange. 2004. https://innovations.ahrq.gov/profiles/nurse-administered-pulmonary-protocol-increases-out-bed-activity-shortens-length-stay-and

ACTIVITY PROGRESSION PROTOCOL

Level

I. OOB to chair for 20 minutes during first 24 hours after admission
II. OOB to chair for all meals
III. OOB to chair for all meals **plus** ambulation > 5 minutes one to two times per day
IV. Ambulation > 5 minutes three times per day   (Continue OOB to chair for all meals)

Patient's Perceived Rating of Dyspnea	Objective Signs	Intervention
0 No shortness of breath (SOB) 0.5 Slight SOB	Patient is able to sing	Continue activity and monitor for signs of intolerance
2 Mild SOB 3 4	Patient is able to complete a sentence without gasping	Continue activity and monitor for signs of intolerance
5 Strong or hard breathing 6	▪02 Sat < 90% ▪Patient cannot complete a sentence ▪Patient's perceived dyspnea rating is ≥ 5 ▪Diaphoresis	Stop activity Lean or sit Increase 02 by 1-2 L to maintain 02 Sat > 90%. Resume activity when 02 sat recovers and symptoms abate
7 Severe breathing or SOB 8 9 10 SOB so severe you need to stop and rest	▪Chest pain ▪Significant arrhythmias or ischemic changes ▪HR with sustained change of > 20% ▪Decrease in SBP > 18 mmHg ▪Diastolic BP > 110 mmHg	Stop activity → lean or sit. Increase 02 by 1-2 L to maintain 02 Sat > 90%. Return patient to room as soon as able

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Consider PT Eval & Treat for:

- Morbidly obese patients
- Demonstrated unsteady gait requiring assistance
- Demonstrated loss of balance or lean when sitting
- Patient inability to progress to a higher level of activity

Adapted from:
Ries, A. L. (2007). Pulmonary Rehabilitation: Joint ACCP/AACVPR Evidence-Based Clinical Practice Guidelines. *Chest, 131*(5 Suppl), 4S-42S. doi: 10.1378/chest.06-2418
Mundy, Linda M, Leet, Terry L, Darst, Kate, Schnitzler, Mark A, & Dunagan, William Claiborne. (2003). Early mobilization of patients hospitalized with community-acquired pneumonia. *Chest Journal, 124*(3), 883-889.
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Activity Progression Protocol

Four levels of activity progression

I.   **OOB to chair for 20 minutes during first 24 hours after admission**

II.   **OOB to chair for all meals**

III.   **OOB to chair for all meals plus ambulation > 5 minutes one to two times per day**

IV.   **Ambulation > 5 minutes three times per day (Continue OOB to chair for all meals)**

Activity Progression Protocol

- Assess patient for readiness

- Increase oxygen 1 -2 L/min during exertion *as needed* to maintain saturation at ≥ 90%

- Utilize wheeled walkers (Rollator) for ambulation

- Monitor patient during activity for signs of intolerance

- Intervene per protocol guideline

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Results

Aim 1

- For every additional ambulation activity per day, the patient is 2811 times more likely to be discharged home ($p < 0.001$).

- For every additional up to bathroom (BRM) activity per day, the patient is 7.7 times more likely to be discharged home ($p = 0.040$).

Results

Aim 1 Probability Point Estimates

- One ambulation activity per day results in a 99 - 100% estimated probability of discharge to home

- Two weight bearing activities per day is associated with 98.8 – 100% estimated probability of discharge to home

Results

Aim 1 Probability Point Estimates

- Increasing frequency of chair and dangle activity shows little increase in probability of discharge to home

- Increasing chair activity more than once per day may decrease probability of discharge to home

- Dangle at bedside more beneficial than chair

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Results

Aim 1 Probability Point Estimates

- BRM (up to bathroom) once per day is associated with a 95-98% probability of discharge to home

- BSC (bedside commode) more than once per day shows little increase in probability of discharge to home

Results

Aim 2 Model Summary

- Predictors in the model accounted for 35.1% of the variability in hospital length of stay ($R^2 = .3519$, adjusted $R^2 = .3379$)

- Model statistically significantly predicted hospital length of stay ($F = 25.16$ (6,284), $p < 0.001$).

Results

Aim 2 Individual Predictors Contributing to Model

- For each additional ambulation activity per day, length of stay decreases by between 0.26 and 0.57 days, on average ($p < 0.001$)

- For each additional day to first out of bed activity, the length of stay increases by between 0.06 and 0.129 days, on average ($p < 0.001$)

Results

Aim 3

- None of the activities, nor timing of activity, had a significant effect on 30 day readmission

Results

Aim 4

- Early first out of bed activity is predictive of discharge to home (p = 0.027)

- Increased time to first out of bed activity is predictive of longer hospital length of stay (p < 0.001)

Results

Aim 4

- For every additional day to first out of bed activity, the patient is .751 times less likely to be discharged home.

- For each additional day to first out of bed activity, the length of stay increases by between 0.06 and 0.129 days, on average.

Results

Aim 5

Differences in outcomes of COPD versus non-COPD

- COPD patients had longer LOS (p = 0.038)

- COPD patients are less likely to be readmitted within 30 days (p = 0.008)

- COPD patients more likely to be discharged to home (p = 0.023)

Results

Aim 5

Differences in activity of COPD versus non-COPD

- COPD patients experience more non-weight bearing activity (p = 0.001)

- Average weight bearing activities per day and time to first out of bed activity were not significantly different

Conclusions

- COPD patients experience less weight bearing activity during hospitalization when compared to patients with other diagnoses.

- Early and progressive weight bearing activity contributes to preservation and promotion of functional status for COPD patients during hospitalization.

Implications for Practice

- Nurses' role in basic mobility

- Nursing based measures of functional status

- Nursing resources for patient mobility

Implications for Practice

- Need for a hospital associated deconditioning model for older adult patients with COPD

- Nurse-driven mobility protocol for COPD

Implications for Practice

ACTIVITY PROGRESSION PROTOCOL (revised)

I. OOB to chair for 20 minutes during first

24 hours after admission

II. Ambulate for toileting:

ambulate to bathroom OR

progressive ambulation distances to BSC

(if unable to ambulate to bathroom)

III. Ambulate outside the room once per day <u>plus</u>

ambulate to bathroom for toileting

The Historic Battle with Bed Rest
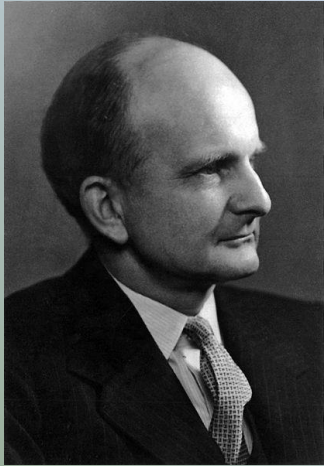
"Look at a patient lying in bed.
What a pathetic picture he makes.
The blood clotting in his veins,
the lime draining from his bones,
the scybala stacking up in his colon,
the flesh rotting from his sweat,
the urine leaking from his distended bladder,
and the spirit evaporating from his soul"

Richard Asher, MD 1947

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