Preventing Readmission With COPD: Transitioning from Acute to Home Care

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Preventing re-admission with COPD: Transitioning from Acute to Home Care

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Disclosures

None
Course Description

• Re-admission to the hospital for patients with COPD is a national concern and problem as well as it comes with a penalty from CMS if the re-admission occurs within 30 days of discharge.

• Patients with COPD require monitoring beyond the acute care setting and currently evidence supports continued monitoring of these patients beyond the acute care setting and the acute exacerbation.

• However, transition from the acute care setting to the home (or outpatient setting) is not always smooth and communication is often lacking.

Course Description

• This course will discuss the problem of readmission and transition of care, and then discuss the patient with COPD who is treated in the acute care setting and moves to the home setting.

• Identifying the high risk COPD patients will be discussed, the medications the patients may be sent home with, as well as BEST PRACTICE for care in the home and outside the hospital.
Course Objectives

• Upon completion of this course, participants will be able to:
  – Apply the information on COPD diagnosis, prognosis and diagnostic testing and determine risk for readmission and for monitoring in the home setting or out patient setting.
  – Analyze the degree of impairment in patients with COPD by utilizing appropriate outcome measures to monitor their progress from acute care to home care.
  – Compare the information from cases on patients with COPD and determine best practice for home care programs for each case.
  – Apply information on transition of care issues and determine appropriate documentation and transition practices.

Purpose

• Discuss Relevance to the Health Care System
• Discuss why this is relevant to PT
• Discuss what Influence PT Can have
Overview of the problem:
readmission and transition of care issues

COPD Readmission: The Problem

- Hospital Readmissions Reduction Program (HRRP) penalizes hospitals for 30 day readmission and extended this to COPD in October of 2014.
  - Used claims data from 2006-2010 in 7 states
  - 26.8 million admissions which were 3.5% COPD
  - At 30 days: 20.2% were readmitted to hospital
    - Respiratory related diseases accounted for 50% of readmission (COPD common diagnosis) and accounted for 26.7% of ALL readmissions
  - Patients d/c home without home care more likely to be readmitted for COPD than patients discharged to any post acute care (31% vs 18%)
  - Patients readmitted were more likely to have longer median length of stay (5 vs 4 days) and more co-morbidities

Shah 2015
COPD Readmission: The Problem

- Analysis of billing data in 15 states:
  - All cause 30 day readmission rate 20.5%; 1 in 3 is related to COPD
  - Majority of admissions is due to comorbidities
    - Comorbidities include cardiac, renal, GI and concurrent infections
  - Greater COPD exacerbations in areas with lower socio-economic income, black race

COPD Readmission: The Problem

- General Recommendations to decrease readmissions:
  - Improve access to care
  - Improve quality and coordination of care post D/c
    - Assist with out of pocket costs for prescription medications
    - Improve availability of transportation to appointments
  - Programs that reduce unplanned readmissions
    - Use evidence based guidelines
    - Medication reconciliation
    - Promote self management skills and Use handoffs during transition
Predictors of Readmission

Retrospective study on 106 patients (Amalakuhan 2011) determined the following predictors:

- Employment status
- BMI
- # previous surgeries
- Albumin level on admission
- Presence of administration of azithromycin/ceftriaxone/moxifloxacin

Garcia-Ayermich (Thorax 2003) (344 pts)

- 63% were readmitted at least once (followed 1.1 years)
  - Strong association between usual physical activity and reduced risk of readmission to hospital
    - High level of usual physical activity associated with 46% risk reduction for readmit
  - \( \geq 3 \) COPD admissions in year before recruitment into study
  - \( \geq 3 \) COPD ER visits
  - Lower FEV1%
  - Lower pO2
Is Frailty a factor?  Flint: Circ Heart Fail 2012

- Short Physical Performance Battery
- Gait Speed
- Handgrip Strength
- Lee criteria (Circulation 2010)
- Frailty Index- Comprehensive Geriatric Assessment (Jones Am Ger Soc 2004)
- Comprehensive Assessment Frailty (Sundermann Eur J Card Surg 2011)
- Frailty Staging System (Cacciatore Eur J Clin Invest 2005)
- Robinson (Ann Surg 2009)
- Edmonton Frailty Scale (Dasgupta; Arch Gerontol Geriatri 2009)

Fried Criteria for Frailty

- Unintentional weight loss
- Weak handgrip strength
- Self reported exhaustion
- Slow gait speed
- Low self reported physical activity
Take a DEEP Breath

COPD: diagnosis, diagnostic tests, symptoms, medications and treatment
Definition and Characteristics of COPD

- Characterized by air trapping, bronchospasm, lung hyperinflation, diaphragmatic flattening, and difficulty getting air **OUT** of the lungs
- Commonly a combination of Emphysema, Chronic Bronchitis, Chronic Asthma
- Deterioration of small airways, alveolar walls, and dilation of alveolar spaces

Additional Characteristics of COPD

- Loss of elastic recoil
- May have reduced/absent breath sounds and retain CO2
- Commonly use Accessory Breathing Muscles: SCM, Scalenes, Upper Trapezius
- Poor posture: Forward head, protracted/ elevated shoulders, thoracic kyphosis
- Barrel chest
- Often see weak peripheral musculature and impaired balance
COPD Diagnostic Testing

- Pulmonary Function Tests (PFTs)
  - Reduced dynamic expiratory air flow (FVC, FEV1, FEV1/FVC): < 70% predicted
  - Increased Residual Volume (RV): nl RV = 1200 ml
  - Diffusing Capacity (DLCO)
- Chest Imaging: Chest X-Ray*, CT, MRI
- Arterial Blood Gases (ABGs): PaO2, PaCO2, pH
- Patient History: Passive/Active smoker, children respiratory problems, older age, exposed to poor air quality, poor dentition, poor nutrition, family history, shortness of breath with activity

Initial Symptoms of COPD

- Shortness of breath with some tasks
- Persistent cough
- Productive cough of mucus from lungs, not related to respiratory infection
- Older age: > 40 years old
- Fatigue
- Difficulty breathing and sleeping or talking
Common Medications for Ongoing Treatment of COPD

- Bronchodilators: (Short and Long Acting) Relax smooth muscle surrounding bronchioles
- Inhaled Steroids: Decrease inflammation
- Oral Steroids: Systemic pathway to further decrease inflammation
- Oxygen: Rest, Sleep, Exercise
- Occasionally expectorants, cough suppressants

Criteria for Out-Patient Pulmonary Rehabilitation or Therapy

- Muscle weakness
- Poor endurance, de-conditioning
- Balance and ambulation impairments
- Inability and/or decrease in self-management and/or ADLs
- COPD exacerbation
- Preparation for upcoming surgery
  - Lung Cancer surgery or treatment
  - Chronic thromboembolic pulmonary hypertension (CTEPH) surgery
  - Transplantation (Lung, Heart/Lung, Multiple organ)
  - Prior to other surgery with significant H/O pulmonary disease
- Rehabilitation following surgery
Out-Patient **Pulmonary Rehabilitation**

- Physical Therapists may use bundled billing code for NCD for Pulmonary Rehabilitation (G0424)
- G0424 = 1 unit of PR (at least 31 minutes of exercise, max 2 units/day or 91 minutes of exercise)
- Max of 72 lifetime units; > 36 sessions, must use KX modifier
- May be used by any “licensed health care provider”
  - Stage II,III,IV COPD per GOLD guidelines
  - Medicare insurance coverage: either primary or secondary, regardless of age
  - Documented diagnosis of “COPD” by MD

PT-based **Pulmonary Therapy**

- Physical Therapists can treat any patient with a pulmonary diagnosis with impairments that qualify them for skilled PT
  - Decreased endurance, deconditioning
  - Muscle weakness (including respiratory muscles)
  - Ambulation or balance impairments
  - Poor airway clearance
  - Poor breathing or cough mechanics
  - Poor balance
- May use CPT codes for component billing (Evaluation, Physical Performance Testing, Treatment)
Treatment of the acute exacerbation in the acute care and home care settings

COPD Case

- 66 year old male diagnosed with COPD, PFTs reveal FEV1 42%, FEV1/FVC 56% uses 2L O2 via nasal cannula, Meds: Spiriva, Xopenex in nebulizer. Admitted with acute exacerbation of COPD with ABGs: 7.29/pCO2 72/pO2 56/HCO3 30 placed on BiPAP
Acute exacerbations

- Occur approximately 1.3 times/year
- Defined as an acute change in patient’s baseline dyspnea, cough or sputum that is beyond normal variability and sufficient to warrant a change in therapy (ATS/ERS definition)
- Classified as mild, moderate or severe based upon intensity of medical intervention required to control patient’s symptoms
- Presentation may be a transient decline in function to a fatal event
- Exacerbations contribute to high mortality rate associated with the disease

Classifications of exacerbations by severity

<table>
<thead>
<tr>
<th>Severity of Exacerbation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>Can be controlled with an increase in dosage of regular medications</td>
</tr>
<tr>
<td>Moderate</td>
<td>Requires treatment with systemic corticosteroids and antibiotics</td>
</tr>
<tr>
<td>Severe</td>
<td>Requires eval in Emergency Dept or hospitalization</td>
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</tbody>
</table>
Treatment of Acute Exacerbation

- Noninvasive positive pressure: improves respiratory acidosis, need for intubation, decreases RR, and decreases hospitalization
- Inhaled bronchodilators: relieve dyspnea and improve exercise tolerance
- Short course of systemic corticosteroids: shortens hospital stay, increases time to subsequent exacerbation, improves FEV1 and hypoxemia
  - Current recommendations are 5 days treatment equivalent to 3 weeks.
- Low dose steroids are NOT inferior to high dose steroids in decreasing treatment failure
- Oral prednisolone is equivalent to IV prednisolone in decreasing risk of treatment failure

Treatment of Acute Exacerbation

- Antibiotics should be used in patients with moderate or severe exacerbation, especially if increased sputum or need for hospitalization
- Smoking cessation decreases mortality and future exacerbations
- Long term oxygen therapy decreases risk of hospitalization and reduces hospital stay
Management of acute exacerbation

• Two major actions:
  – Relieve acute symptoms
  – Reduce the risk of subsequent exacerbations

Management of Acute Exacerbation

• Oxygen therapy
• Medical management
  – Beta adrenergic agonists
  – Anticholinergic agents
  – Systemic glucocorticosteroids
  – Antibiotics and antivirals
• Monitored activity: progressive endurance activity and strengthening exercises
• Supportive care/Palliative care
• Ventilatory Support
Evidence with COPD

- Quadriceps weakness present in COPD Kharbanda Int J COPD 2015, Spruitt Thorax 2003
  - Magnitude of Quad weakness related to severity of COPD
- Quad strength related to prognosis Swallow; Thorax 2007
- 6MWD < 350 meters is associated with increased risk of mortality Cote Eur Resp J 2008
- Determinants of poor 6MWD (ECLIPSE study) Spruitt 2010
  - Severe airflow limitation, amt of emphysema, O2 use, presence of depressive symptoms and mod to severe dyspnea

Assessment of Frailty

- Assess frailty and make a plan for decreasing frailty upon discharge
  - Options: SPPB, Gait speed alone, 5 min walk, or any other option
Role of PT with COPD in acute care

- Combination of endurance and strength training is essential for rehab and improved morbidity and mortality
  - Maximize pulmonary function (optimizing timing of medications) prior to exercise
  - Quad Strengthening
  - UE and LE strengthening
  - Consider high intensity interval training if tolerated
  - If cannot perform high intensity then perform low intensity longer duration activity
  - Supplemental oxygen should be maximized with activity

Role of oxygen with COPD
Role of Oxygen

- Oxygen therapy is of central importance in the hospital treatment of exacerbations:
  - administration for greater than 15 hours per day increases survival and improves hemodynamics, exercise capacity, and general alertness.
  - The role of oxygen in patients with mild hypoxemia is controversial
  - oxygen is recommended for patients with very severe COPD (partial arterial oxygen pressure [PaO₂] < 55 mmHg or oxygen saturation < 88%) and the goal of therapy is to preserve the function of vital organs by increasing the PaO₂ to ≥ 60 mmHg and oxygen saturation to ≥ 90

Pulse Oximetry

Problems with Pulse Oximetry:
- blood flow, irregular heart rhythm, anemia
Supplemental Oxygen Utilization during Physical Therapy Interventions

Task Force on Supplemental Oxygen: Ellen Hillegass, PT, EdD, CCS, FAACVR, FAAPT; Ann Fick, PT, DPT, MS, CCS; Amy Pawlik, PT, DPT, CCS; Rebecca Crouch, PT, DPT, CCS, FAACVPR; Christiane Perme, PT, CCS; Rohini Chandrashekar, PT, DPT CCS; Susan Butler McNamara, PT, MMSc, CCS; Lawrence P. Cahalin, PT, PhD, CCS

OXYGEN ALGORITHM

1. Correct use of oxygen monitoring devices list
2. Order example: "Titrate oxygen to maintain $SpO_2 = \text{__}%"
3. Oxygen delivery system needs to be changed to maintain/improve oxygenation
Additional mechanisms to provide oxygen: Noninvasive Ventilation

CPAP versus BiPAP

• **CPAP** = continuous positive airway pressure
  – Indications: sleep apnea, inability to maintain adequate blood gases while sleeping, noninvasive mechanism to decrease elevations in pCO2, keep airways and air sacs open longer for better gas exchange

• **BiPAP** = two levels of pressure...some pressure for inspiration, some pressure on expiration.
  – Indications: for individuals who are weak, and unable to have full inspiration, as well as unable to keep airways and air sacs open on expiration
New Oxygen findings: LOTT

• Guidelines on Oxygen:
  – SpO2 88% at rest or less: long term oxygen KNOWN to reduce mortality
  – Less severe hypoxemia unclear
    • SpO2 89-93% at rest
    • SpO2 < 90% for 10 seconds and > 80% for > 5 min during walk
    • Older individuals did better with O2
    • Poorer quality of life did better with O2
    • Exacerbation within past 3 months: reduction in rehospitalization if given O2  NEJM Oct 2016

Case: D/C status from Acute Care

• D/C on 3 liters O2 nasal cannula (has oxygen at home),
• 6min walk test results: walked 420 ft with 4 rests. Max drop in SpO2 to 82 with dyspnea 8
• Performed SPPB:
  – Could not stand without use of arms, only could do 3 sit to stands performed in 20 secs
  – Balance: lost balance with semi tandem at 3 secs. No tandem performance
  – Gait speed: 0.48 m/sec.
What about after the acute care admission? What is the transition to home care?

Functional Status and Re-hospitalization Risk

- Patient’s with COPD who were non-ambulatory at discharge were more than twice as likely to be re-admitted in 30 days compared to patients able to ambulate 50 feet.
- Patient’s able to ambulate < 50 feet were not more likely than those that could ambulate >50 feet to be re-admitted.
- Risk of re-hospitalization within 30 days increased with:
  - Hx of prior hospitalizations within 12 months
  - New Prescription for Oxygen at Discharge
  - Presence of anemia at admission
  - Chronic Pain
  - Visit to ED or an observational stay within 30 days of DC and prior to a readmission that occurred.
  - Length of stay longer than 13 days

Physical Activity - Predictor of 30 day Rehospitalization

- Prospective Study
- Accelerometer continuously tracked PA for 30 days
- Inactivity defined as fewer than 60 minutes per week
- Lower levels of PA (1st week after hospital discharge) 6.7 times more likely to be re-hospitalized (all cause)
- < 60 min/day of higher intensity PA = sig predictor of re-hospitalization
- PA decreased over time in those who were eventually readmitted, but, increased in those who were not readmitted
- Increased risk for re-admission noted for patients who did not leave the house in the week preceding the initial hospitalization (functional biomarker)


Re-hospitalization Risk Factors

- Exacerbations are frequently not fully resolved at the time of discharge
- Disjointed patient management
- Patient training is inadequate
  - patients may not administer medications correctly
  - they may not have their oxygen or be sufficiently oxygenated
  - they may have resumed smoking
  - remain sedentary
- Lack of professional follow-up care occurs post discharge.
- Equipment in the home is inadequate
  - Oxygen equip is impediment to the patient being active (heavy port tank)
- Lack of a Rapid Action Plan

Rapid Action Plan

- Pts recognize the early signs of an exacerbation (↑ than usual dyspnea upon the same exertion and change in sputum).
- Call doctor; start steroids, antibiotics, bronchodilators and fluids; adjust oxygen; and engage in pursed lips breathing.
- A checklist-procedure should be in place for specific interventions by the patient, physician, ED physician, hospitalist, and COPD coordinator.

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Signs and Symptoms of COPD

**Green Zone = “All Clear”**
Means: Your symptoms are under control; Continue taking your meds; Continue avoiding environmental triggers and extremes, keep your medical appointments

No New Shortness of Breath, coughing or chest pain  
No decrease in your ability to maintain your activity level  
You have no new symptoms

**Yellow Zone = “Caution”**
If you begin to have any of the following signs and symptoms: call your health care provider as soon as you notice any of these changes.

You are coughing more than usual and/or your mucous changes in color, consistency  
You have increased sputum production  
You have increased shortness of breath  
You need more pillows to sleep, you need to sleep sitting up in a chair

**Red Zone = “Medical Alert”**
You need to be evaluated by a physician right away. Call 911

You have unrelieved shortness of breath or increased shortness of breath at rest  
You have chest pain  
You have wheezing or chest tightness at rest  
You have confusion or inability to think clearly

Adapted from LIHN “Managing your COPD” Teaching Guide. LIHN.org
Teach Back

• Did you know that patients forget up to 80% of what you tell them after a visit?
• If they do remember, only half of what they remember is correct.

Steps to Teach Back.
1. Share
2. Ask
3. Listen
4. Share Again
5. Ask Again

Adapted from: AHRQ.gov Guide to Patient and Family Engagement in Primary Care.

Transitional Care Plans

• COPD Coordinator - role is one of educating and training the patient and family to self-monitor and self-manage post discharge (patient-centered care)
• Efficient and effective communication
• Seamless discharge – ensure there is no interruption in the medications and care plan from the hospital to the home
• Home visit (proper equipment, med rec, smoking cessation, cog./family/financial considerations)
• Make distinction between treatment (acute) and prevention (chronic)

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# Transitional Care Plans

## Acute
- Active treatment occurs only during acute exacerbation.
- Time-sensitive treatment is frequently delayed.
- A COPD exacerbation is a dynamic process leading to destruction and airway remodeling.
- Time sensitive (time is tissue). When destruction occurs, repair takes longer and tissue may not fully repair.

## Chronic
- The chronic component often is not addressed.
- Even when the patient gets pulmonary rehabilitation, it is a short-term solution for a problem that is lifelong, progressive and gets worse over time.
- How patients manage their care at home

## Transitional Care Plans
- Active Lifestyle supports physical and mental health, supports airway clearance and helps with early exacerbation recognition and rapid response.
- Proper equipment (MDI spacer, oxygen titrated via pulse oximetry to ensure oxygenation as well as mobility, pulse ox for low ox saturation and biofeedback for pursed lip breathing, airway clearance devices)
- Pulmonary Rehab, smoking cessation
Home Health Agency Data - 2016

- **1022 patients** admitted with a primary Dx. of COPD.
- **251** were readmitted within **30 days**.
- COPD re-hospitalization rate for the year **24.5%**
- **71 patients** or approximately **28%** of all readmissions are admitted between **8 and 14 days** on service.
- Only **30 patients** or **11%** admitted in the first 3 days.

Possible reasons for readmissions?

Medication Non-Adherence

“Adherence is influenced more by patients’ perception of their health and medication effectiveness, the presence of depressed mood and co-morbid illness than by demographic factors or disease severity.”

- Low adherence with medications was present in **29.5%** of the patients.

Therapy Interventions for COPD

- Patient education in symptom management during exercise (especially breathlessness)
- Flat walking track (preferably indoor and air-conditioned), resistance bands, hand weights and pulse oximeter
- Assessment: Six-minute walk test (6MWT), dyspnea scale, pulse oximeter, device to measure blood pressure, spirometer, disease-specific quality of life questionnaire (e.g., St. George’s Respiratory Questionnaire or Chronic Respiratory Disease Questionnaire).
- Results - Improved QoL & functional exercise capacity in intervention group


Best Practices

- Patient-Centered Focus
- Medication Management
- Communication and Care Coordination
- Timely Follow-Up by the Health Care Team (including the primary care physician and home health)
- Patient-activated Education and Coaching
- Self Management
  - Oxygen Use
  - Medication Adherence
  - Activity Level
    - Stretching, aerobic, resistance
  - Diet
  - Patient Education Materials
  - Teach Back
Home Care Best Practices

• Patient Training (use of Teach Back)
  • Meds, Mobility, Titration of home oxygen, Pursed-Lip Breathing, Airway clearance, Avoidance of smoking, avoidance of exposure to perfumes, dusts, chemicals

Physical Activity Recommendations

• 30 minutes of moderate intensity (MET ≥ 3) at least 5 days per week or at least 20 min of vigorous-intensity physical activity (MET ≥ 6) ≥ 3 days per week or a combination of both.

• British Thoracic Society
  – Moderate intensity aerobic training @ 60% of peak work rate for 30-60 minutes per session
  – Resistance Training to major muscle groups - Quads - 2-4 sets of 10-15 reps. 48 hours between sessions
Physical Activity Vital Sign (PAVS)

Patient Report Measure
1. On average, **how many days a week** do you perform physical activity or exercise?
2. On average, **how many total minutes** of physical activity or exercise do you perform on those days?
   \[ \text{days/week} \times \text{minutes/day} = \text{min/week (PAVS)} \]
3. Describe the **intensity** of your physical activity or exercise:
   - Light = casual walk
   - Moderate = brisk walk
   - Vigorous = jogging


International Classification of Functioning, Disability and Health

Contextual Factors – Barriers and/or Facilitators for optimizing outcomes
- Environmental Factors - architectural, support system, attitudinal
- Personal Factors - occupation, hobbies, finances, education level
International Classification of Functioning, Disability and Health (ICF)

Co-Morbid Conditions

- Anxiety
- Depression
- Osteoporosis
- Steroid induced diabetes (hyperglycemia)
- Active Smoker

- Long Term Steroid Use side effects
  - Skin fragility
  - Myopathy
Co-Morbid Barriers

**Anxiety**
- Related to poorer health outcomes including worse submaximal exercise performance (less distance walked during the 6-min walk test: -66.3 feet for anxious vs non-anxious groups; 95% CI -127.3 to -5.36)
- Greater risk of self-reported functional limitations (OR 2.41; 95% CI 1.71 to 3.41)

**Depression**
- Greater in LTA group than HTA group (P=0.004)
- Vitality Score - (SF-36) lower in LTA (P=0.01)


RECOMMENDATIONS
Recommendations

- Early mobilization in hospital with PT
- Assess Discharge status and communicate to discharge agency directly
- Assess oxygen needs for home and activity
- Address psychosocial factors and co-morbidity
- Medication Adherence/Review for intended effects/side effects
- Physical Activity promotion (+) effect on depression/anxiety/physical functioning

Anyone have Questions?
References


2. Desai AS and Stephenson LW. Rehospitalization for Heart Failure: Predict or Prevent? Circulation 2012;126:501


References


