COPD: Reducing Rehospitalizations

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COPD = “Irreversible airflow obstruction”

Reversible airflow obstruction (reversible with bronchodilator) = asthma

Irreversible airflow restriction (the restrictive lung disease) = pulmonary fibrosis

COPD: 2 types
(most people have some components of both types)

Emphysema:
- air sacs (alveoli) damaged, gas exchanged impaired

Chronic Bronchitis:
- inflammation of lining of bronchial tubes, mucus formation

“Can’t breathe, air trapped”
“Cough, cough, cough”

Disease Process

Inflammation of airways, production of mucus: shortness of breath and cough

Systemic effects: weight loss, muscle wasting (as with any chronic disease)

Structural changes: damage to alveoli & stiffening of large airways

Emphysema
“Pink puffer”
- Alveolar damage = less surface area for gas exchange. Body compensates with hyperventilation (“puffing”). Body does compensate enough to maintain ABG’s within normal = “pink” color

Chronic Bronchitis
“Blue bloater”
- Airways obstructed by inflammation and mucus = ↓ ventilation, CO₂ retention (hypercapnia) causes cyanosis (“blue”) & residual lung volume increases (barrel chest = “bloat”)

Many people have components of both
Main symptoms: shortness of breath, mucus production
**Etiology**

- 80-90% of COPD caused by smoking
- Other causes:
  - Second-hand smoke
  - Occupational exposure (firefighters, carpenters, asbestos)
  - AAT deficiency (Alpha-1 anti-trypsin deficiency)

AAT is a protein that normally protects lungs from the damage of inflammation. People who do not produce enough AAT are more likely to develop emphysema (and usually at a younger age - 30-40 years)

COPD is *almost always* preventable

Though not fully reversible, COPD is *treatable*

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**How Common is COPD?**

4th most frequent cause for readmissions of Medicare patients

Leading causes of Medicare readmissions in 2011

- #1 CHF
- #2 Septicemia
- #3 Pneumonia
- #4 COPD and Bronchiectasis
- #5 Cardiac dysrhythmias

12 million people are diagnosed with COPD in the U.S. (6.3% of adults). Another 12 million have COPD, but don’t know it yet.

1 death from COPD every 5 minutes (2004)

You may have a patient on HC for a different primary illness but concomitantly they have COPD. Commonly: CHF, DM, vascular diseases

In patients with Stage IV COPD, prognosis ~ 2-4 years

You may have a patient on HC for years (or through multiple HC episodes)

These patients are “frequent fliers”

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**Impact of COPD**

Financial Burden

- In 1 year, COPD hospitalizations in Wisconsin total $131 million, not including the 7,000 ER visits costing another $13 million
- Annual cost (2007) to the nation for COPD $42.6 billion
- Hospitalizations, primarily for exacerbations, account for approximately two-thirds of the costs of COPD care.

= It is more cost-effective to manage these patients at home than for them to be hospitalized

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**How Common is COPD?**

3rd leading cause of death in the U.S.

Leading causes of death in 2010 (and number of deaths)

- #1 Heart disease: 597,689
- #2 Cancer: 574,743
- #3 Chronic lower respiratory diseases: 138,080
- #4 Stroke (cerebrovascular diseases): 129,476
- #5 Accidents (unintentional injuries): 120,859
- #6 Alzheimer’s disease: 83,494
- #7 Diabetes: 69,071
- #8 Nephritis, nephrotic syndrome, and nephrosis: 50,476
- #9 Influenza and Pneumonia: 50,476
- #10 Intentional self-harm (suicide): 38,364

CDC, 2013

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**Impact of COPD**

Burden on QOL

- 51% of COPD patients say their condition limits their ability to work
- 70% say it limits them in normal physical exertion
- 56% limits household chores
- 53% limits social activities
- 50% limits sleeping
- 46% limits family activities

(American Lung Association, 2004)
Why are COPD patients hospitalized?

#1 reason: COPD exacerbation

COPD exacerbation is as detrimental as a heart attack!

Same consequences as a heart attack on:
- QOL
- Future hospitalizations
- Mortality

COPD Exacerbations

With each COPD exacerbation:
- ↓ muscle mass and ↓ exercise tolerance
- ↑ likelihood of becoming housebound
- ↓ QOL – both short- and long-term
- Further \textit{permanent} lung damage \(\rightarrow\) ↑ dyspnea, more likely to have another exacerbation in the future, faster rate of decline in lung function

(Risk increases with advancing age, multiple co-morbidities, and as the course of the disease progresses)

Consequences of Exacerbation

• With any given COPD exacerbation,
  – 8-15% of patients die in the hospital
  – 25-40% die within a year of that hospitalization

Frequency of Exacerbations

• Early in disease, 1-2 exacerbations per year
• As the disease progresses, ever-increasing frequency of exacerbations, 2-3 per year

With each exacerbation:
- ↓ health
- ↓ QOL
- ↑ costs $$$

Signs of COPD Exacerbation

Your patient will know his \textit{baseline} level of:
- Sputum color
- Sputum amount
- Dyspnea
  - \(\text{SpO}_2\) may be 92-95% with or without oxygen

COPD Exacerbation:
  Must have at least 1 of the following for diagnosis:
  - Increased amount of sputum
  - Increased sputum purulence (yellow, green)
  - Worsening dyspnea
  - \(\text{SpO}_2\) < 88%

Red Flags

Signs of impending exacerbation:
- RR > 30
- SBP < 90
- DBP < 60
- Elevated temp
- Pulse ox < 88-90% with \(\text{O}_2\)
- Cyanosis of the skin (late sign)
- Inability to complete a full sentence
- Inability to tolerate usual level of activity
Rating Dyspnea

Dyspnea scale 0-10

How to Avoid Exacerbations

Avoid Triggers

Certain things (“triggers”) can cause (or “trigger”) a COPD exacerbation by causing irritation and over-reaction of the airways.

Every person has different triggers

Triggers include:
- Infections
- Fumes from cleaning products, paint, air deodorizers, SMOKE

Avoiding Triggers: Inhaled Irritants

Smoking – including second-hand

Indoor pollution – dirt, dust, mold/mildew in sink or bathtub, pet hair, saliva, dander

Outdoor pollution – check online or in newspaper for pollen reports, humidity index

Industrial – proper protective precautions – masks

How to Avoid Exacerbations

How to Avoid Exacerbations

Medication Compliance!

Skipping meds can trigger an exacerbation!

Order of use for best effect, acronym:

“For Most Lasting Control of Airways”

- Fast-acting bronchodilator
- Mucolytic
- Long-acting bronchodilator
- Corticosteroid
- Antibiotic

How to Avoid Exacerbations

“For Most Lasting Control of Airways”

#1 Fast-acting bronchodilators –
- Beta 2-agonist bronchodilators:
  - albuterol, levalbuterol, Proventil
- Anticholinergics:
  - Spiriva (tiotropium)
- Combination anticholinergic / beta 2-agonists:
  - DuoNeb, Combivent (ipratropium bromide/albuterol)

#2 Mucolytic
- Mucomyst (N-acetylcysteine)

#3 Long-acting bronchodilator
- terbutaline, formoterol,
- Serevent (salmeterol)
- Pulmicort (budesonide/formoterol)
- Brovana (aformoterol)

#4 Corticosteroid
- Pulmicort (budesonide)
- Flovent (fluticasone)
- Advair (fluticasone/salmeterol)
- Dulera (mometasone/formoterol)

#5 Antibiotic
How to Avoid Exacerbations

Ensure good inhaler technique – Watch your patient!

- Look up to the spot where the ceiling meets the wall
- Exhale fully
- Inhale deeply on inhaler
- Hold breath for 4-6 seconds
- Then exhale
- Wait 1-2 minutes between puffs of inhaler (whether same med or different med) – allow lungs to fully absorb medication \( \rightarrow \) subsequent puffs penetrate deeper

How to Avoid Exacerbations

Consider a spacer!

+ More medication into the lungs \( \rightarrow \) better effect
+ Less medication into mouth and throat \( \rightarrow \) ↓ risk of thrush
+ Medicine lasts longer
+ Easier to use than a regular MDI (metered dose inhaler)

How to Avoid Exacerbations

Non-pharmacologic measures...

- **Breathing techniques** – pursed-lip breathing – helps to improve exhalation
- **Abdominal breathing** – more effective than using accessory muscles (neck, shoulders, chest muscles)
- **Preserving energy**
  - Find efficient ways to do tasks – sit while prepping meal or getting dressed
  - Pace yourself
- **Exercise**
  - Even just a little can: \( \uparrow \) strength, endurance, lung function, energy, mood

How to Avoid Exacerbations

Non-pharmacologic measures...

- **Diet**
  - Eat small, frequent meals to avoid feeling too full (makes breathing difficult)
  - Avoid gassy foods (makes breathing difficult)
- **Protein**
- **Hydration**
- **Sleep**
  - Naps are good!
  - Keep PRN meds near bed to avoid getting up at night
- **Manage co-morbidities**

Smoking Cessation

Even if patient has smoked for years, quitting is proven to:

- reduce damage to lungs
- slow progression of COPD
- improve functional abilities
- prevent exacerbation

The topic of smoking cessation should be gently approached at each visit.
Putting it all together: Reducing COPD Rehosp Rates in Home Care

• Can be thought of as “Pulmonary Rehab” in the home setting

• A good Pulmonary Rehab program includes:
  – Patient education:
    • Disease process
    • Medications
    • Breathing techniques
    • Exercise
    • Nutrition
  – Emotional support

Reducing COPD Rehosp Rates in Home Care

Horizon’s COPD Protocol:

- Team of RNs specially trained in chronic disease management
- Each patient receives educational book & stoplight chart

Reducing COPD Rehosp Rates in Home Care

Horizon’s COPD Protocol:

- RN provides education with use of book
- Patient is taught to self-monitor and log symptoms

Reducing COPD Rehosp Rates in Home Care

Horizon’s COPD Protocol:

- Refer for OT/PT if needed
- Front-load RN visits
  - 3 times in the 1st week,
  - Once weekly x2 weeks,
  - Then once every other week
  - 24/7 RN available for questions or PRN visits
  - RN monitors symptoms remotely every day – how? ....

Reducing COPD Rehosp Rates in Home Care

Horizon’s COPD Protocol:

- Telehealth monitoring
  - “Tele-health” = using telecommunications technology to support long-distance health care
  - Patient feels safer, like someone is “watching over” them
- RN monitors trends on a day-to-day basis

Reducing COPD Rehosp Rates in Home Care

Horizon’s COPD Protocol:

- O₂ < 90%
- ↑ use of rescue inhaler
- SBP >180 or <90, DBP >100 or <60
- S/S URI (change in color or ↑ amount of sputum
- Fever
- ↑ confission, ↓ LOC
- any change that may indicate impending exacerbation
- RN obtains orders for oral antibiotic, steroid, etc. as appropriate
Reducing COPD Rehosp Rates in Home Care

Horizon’s COPD Protocol: Documentation

At each visit – Chart against individualized goals at each visit (see handout)

Reducing COPD Rehosp Rates in Home Care

Horizon’s COPD Protocol: Documentation

1st visit (admission)

OASIS – C1

In Clinical Note:
- Document med compliance and barriers to compliance, as reported by patient (cost $$, side effects, patient forgetful)
- Document education provided to improve med compliance
- Observe patient’s inhaler technique, provide education
- Document patient’s dyspnea rating (0-10) as an objective measurement of shortness of breath

Reducing COPD Rehosp Rates in Home Care

Horizon’s COPD Protocol: Documentation

2nd visit

In Clinical Note:
- Reviewed triggers to avoid (including _______________)
- Instructed on how to monitor symptoms (dyspnea, sputum color/volume), activity tolerance, and how to check pulse oximetry, heart rate, blood pressure.
- Instructed patient to track symptoms/signs on paper log and enter data into Telehealth

Reducing COPD Rehosp Rates in Home Care

Horizon’s COPD Protocol: Documentation

3rd visit

In Clinical Note:
- Reviewed techniques to measure vital signs and advised patient to record VS on paper logs, then to enter into Telehealth device.
- Discussed smoking cessation (if applicable).
- Discussed nutrition and hydration.

Before implementation of program:
- 2011: 15.22% (State 19.44%, National 18.99%) Ranking 66%
- 2012: 14.07% (Stage 19.12%, National 18.88%) Ranking 72%

After implementation of program:
- 2014: 12.35% (State 18.79%, National 18.37) Ranking 76%
- 2015: 8.33% (Stage 16.86%, National 17.7%) Ranking 80%
References


