The Integrated Care of the COPD patient

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DISCLOSURE
~ There is no commercial support nor conflicts of interest related to this presentation

New York Times Editorial
Back in the Hospital Again
April 16, 2009

An alarming one-fifth of all Medicare patients discharged from the hospital end up back in the hospital within 30 days, and fully a third return within 90 days...

...The fundamental problem is the fragmented nature of the American medical system: too often, health-care providers fail to communicate with one another, patients fall between the cracks and no one seems clearly in charge of a patient’s welfare...

...Unplanned re-hospitalizations cost Medicare $17.4 billion in fiscal year 2004, which is a big chunk of the $102.6 billion that Medicare paid hospitals that year...

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New York Times Editorial
Back in the Hospital Again
April 16, 2009

...The most disturbing finding was that half of the medical patients readmitted within 30 days had not seen a physician for follow-up care after they were discharged. They were apparently left on their own, perhaps with poorly understood instructions from the hospital on how to take care of themselves...

...The Affordable Health Care Act has proposed incentives and penalties to encourage hospitals and doctors to cooperate in overseeing care from hospitalization through the first 30 days after discharge. The Administration estimates the approach could save $26 billion over 10 years.

"It is a sound idea that should also improve the lives of patients"

PERCENTAGE OF MEDICARE BENEFICIARIES WITH CHRONIC CONDITIONS


DISTRIBUTION OF MEDICARE SPENDING BY NUMBER OF BENEFICIARIES' CHRONIC CONDITIONS

Definitions

Integration:
• Act of making a whole out of parts
• Coordination of different activities to ensure harmonious functioning

Integrated Care:
• Bring together inputs, delivery, management and organization of services related to diagnosis, treatment, care, rehabilitation and health promotion
• Improve services in relation to access, quality, user satisfaction and efficiency
• Provide an opportunity to coordinate care and focus on the entire clinical course of an individual’s disease

WHO, J Integrated Care, 2001
Terminology

- Integrated care
- Chronic disease management

Disease Management: Key elements

- Comprehensive care: multidisciplinary, prevention & health promotion
- Integrated care: care continuum, coordination of the different components
- Active client-patient management tools: health education, empowerment, self-care
- Evidence-based guidelines: protocols, care pathways
- Information technology: system solutions
- Continuous Quality Improvement


Why integrated care?
Mr S, a 64-year-old patient with diabetes, comes for his 15-minute visit with Dr M. After evaluating Mr S’s acutely painful knee and treating his GERD, Dr M has 3 minutes left to assess diabetic control. Having fruitlessly searched through Mr S’s medical records to find the last eye examination results and hemoglobin A1c (HbA1c) and lipid levels, Dr M gives up in frustration and schedules another visit during her day off to manage Mr S’s diabetes. Mr S does not keep a log of his home glucose determinations.

Ms F arrives for her planned diabetes-management visit. At a previous acute care visit, she discussed her knee pain and GERD with Dr N. Ms F, as taught in her self-management class, hands her home glucose record to the medical assistant, who scans it into the electronic medical record, reviews with Ms F the reminder pop-up message, refers her for an eye examination and test of urine microalbumin levels, and prints for Ms F and Dr N a graph showing the last 2 years of her HbA1c (normal) and LDL (elevated) results. Dr N briefly discusses an action plan to address hyperlipidemia and arranges 2 visits: 1 to the pharmacist, who adjusts Ms F’s medication doses according to a practice guideline–based protocol, and 1 to the nutritionist to discuss low-fat diet options.

The Tyranny of the Urgent

- Acute symptoms & concerns of the patient crowd out the less urgent need to bring chronic disease under optimal control
- Under an acute care system, patients are not taught to care for their own illness
- Visits are brief and little planning takes place
- Division of labor is lacking
“Too often, caring for chronic illness features an uninformed passive patient interacting with an unprepared practice team, resulting in frustrating, inadequate encounters”

-Bodenheimer, JAMA, 2002

The Challenge

- COPD is common, complex and costly
- >50% of cost is due to hospitalization
- Most hospitalizations result from COPD exacerbations which also impact on HRQOL and disease progression
- Major risk factors for admission for COPD exacerbation
  - Previous admission, lower FEV₁, O₂ under-prescription
  - Activity levels

EFRAM study, AJRCCM 2001
Morgan, Thorax 2005

Figure 1

World Health Organization 2006
COPD - definition
A disease characterized by airflow limitation that is not fully reversible

- A multi-component disease
- Extensive heterogeneity
- Produces systemic effects
- Associated with co-morbid illnesses

Overall Prognosis of COPD patients
- Prognosis for COPD is variable and modified by
  - Age
  - BMI
  - Co-morbidities
  - Functional status
  - Severity of lung function impairment
- Tremendous heterogeneity in mortality rates for any degree of airflow obstruction

Prognosis of COPD patients after hospitalization
- In-hospital mortality for COPD exacerbation is ~16%
- With hypoxemia/hypercapnia ~20-30%
- Intubation/mechanical ventilation >50%
- Overall, COPD patients who are hospitalized have 3 year mortality rates approaching 38-50%

Sin, ERJ 2003
Anthonisen, Ann Intern Med. 2005
COPD: systemic effects
- High prevalence (average of 3.7 chronic medical conditions compared with 1.8 for non-COPD patients)
  - Deconditioning
  - Muscle wasting
  - Exercise intolerance
  - Loss of fat-free mass
- Worsening with AECOPD
  - Decramer, COPD, 2008
  - Sin, Eur Resp J, 2006

Focus Areas
- Effective treatment
  - Pharmacological and non-pharmacological
  - Patient self-efficacy
  - Regular follow-up within an organized system of care

Adherence to long-term therapy
Non-adherence is fundamentally a failure of the health care system

QUESTION:
Where does Pulmonary Rehabilitation fit within the concept of Integrated Care?
Management of COPD
GOLD guidelines

<table>
<thead>
<tr>
<th>GOLD 0</th>
<th>Avoidance of risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOLD I</td>
<td>Short-acting bronchodilator as needed</td>
</tr>
<tr>
<td>GOLD II</td>
<td>Regular treatment with \ bronchodilator ICS if significant symptoms and lung function response</td>
</tr>
<tr>
<td>GOLD III</td>
<td>Corticosteroids for exacerbations</td>
</tr>
<tr>
<td>GOLD IV</td>
<td>Oxygen therapy Surgery?</td>
</tr>
</tbody>
</table>

Why?

- Patients with COPD decrease their physical activity due to resultant dyspnea
- Inactivity leads to progressive deconditioning
- Dyspnea increases at even lower physical demands

COPD

Expiratory Flow Limitation
Air Trapping
Hyperinflation

Breathlessness

Deconditioning

Reduced Exercise Capacity

Inactivity

Poor Health-Related Quality of Life

Disability
Disease progression
Death

Adapted from Decramer M. Eur Respir Rev. 2006;15:S3-83.
Physical Activity and COPD

- Physical activity levels are low.
- Low physical activity levels are associated with:
  - Decreased exercise capacity
  - Increased risk of bronchial hyper-responsiveness
  - Greater lung function decline

Low Physical Activity and Lung Function Decline

- Population-based sample, Copenhagen, 6790 persons
- Smoking, lung function, physical activity, covariates assessed, followed over years.
- Levels of physical activity (PA) compared to lung function decline
  - "Low PA": < 2hr walking/cycling per week
  - "COPD": FEV1/FVC < 70%

"Low PA" c/w "Moderate & High PA":
- Greater FEV1 and FVC decline
  - FEV1: 4.8 ml/yr vs 2.6 ml/yr (p trend = .006)
  - FVC: 7.7 ml/yr vs. 2.6 ml/yr (p trend = .001)
- Greater risk of developing COPD
  - OR if in "Moderate & High PA": 0.77 (p = .027)

Low Physical Activity is Associated with Increased Risk of All Cause- and Respiratory Mortality

- Garcia-Aymerich, AJRCCM '07; 175:458-63
- "Low PA" c/w "Moderate & High PA":
  - Greater risk of mortality
  - OR 1.30 (95% CI: 1.10-1.52) for all-cause mortality

Garcia-Aymerich, Thorax '06; 61:772-8
Risk Factors for Readmission to Hospital for a COPD Exacerbation: a Prospective Study

- 340 pts recruited during admission for AECOPD, f/u mean 1.1 years
- 63% pts readmitted at least once; 29% died
- Increased risk of readmission:
  - > 3 COPD admissions in prior year (OR 1.66)
- Decreased risk of readmission:
  - Higher levels of usual physical activity (> 232 kcal/day) (OR .54)

Garcia-Aymerich J, Thorax '03; 58:100-5.

Lung Function Decline

COPD Exacerbation

Health Status

Healthcare Utilization (Cost)

Mortality

Symptoms

Functional Status

Chenna, Semin Resp Crit Care Med '10; 31:286

Patients Who Remain Inactive Following AECOPD are More Likely to be Readmitted with a Subsequent Exacerbation

Pitta, Chest 2006; 129:536-44.
Inactivity is Bad

- Improves exercise tolerance
- Reduces dyspnea
- Improves health-related quality of life
- Improves education: self-management
- Reduces health care costs (hospitalizations and LOS)

Potential to decrease number and/or severity of exacerbations!

Pulmonary Rehabilitation

- Improvement in exercise tolerance
- Reduction in dyspnea
- Improvement in health-related quality of life
- Improvement in education: self-management
- Reduction in health care costs (hospitalizations and LOS)

Prevention of Exacerbations

- Avoidance of triggers
- Pharmacologic therapy
- Disease management programs
- LVRS
- Oxygen
- Prevention of exacerbations
- Mechanical ventilation
- Impact disease progression
- Prevent lung function decline
- Pulmonary rehabilitation
- Hastens recovery

Chest '97; 112:1363-96
Thorax '01; 56:827-34
AJRCCM '05; 172:19-38
Chest '07; 131(5Suppl)4S-42S
AJRCCM '06; 173:1390-1413

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PR is Feasible and Effective after AECOPD

Systematic Review, 9 trials, 432 patients

**Improved Exercise Tolerance**

**Improved Quality of Life**

Puhan MA, Cochrane Review 2011

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**PR in the Post-Hospitalization Period**

- 42% reduction in chance of hospital admission (OR 0.22) over median f/u 25 wks.
- >16% reduction in mortality risk (OR 0.28)
- No adverse events

Puhan, Cochrane Database Syst Rev 2011

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**Prevent Exacerbations and/or Reduce their Severity**

- Impact Disease Progression
  - Lung Function Decline
  - Hospitalizations
- Increase Physical Activity
- Improve Disease Understanding and Self-management

Pulmonary Rehabilitation

Prevent Functional Status Decline and Hasten recovery From Exacerbations
Long term strategies for pulmonary rehabilitation

- Induction (6-12 weeks)
- Continuous
- Maintenance
- Repeated

Challenges remain
- Continuous rehabilitation, maintenance programs, repeated courses of rehabilitation only seem to have a small additional benefit
- Monthly interventions/telephone support appear to wear off rapidly with discontinuation

* underscores the need to promote health behavior change during the PR program

Maintenance of Benefits

Self-Management Education

- Emphasizes illness control through health behavior modification
- Increases self-efficacy with the goal of improving clinical outcomes

*Self efficacy refers to the belief that one can successfully execute particular behaviors in order to produce certain outcomes
Self-Management Education

- Emphasis on prevention & early treatment of exacerbations
  - Recognizing symptoms
  - Responding early to a predetermined action plan
- Speeds recovery
- Reduces health care costs

Patient Action Plan

Difference in all-cause hospitalizations (standard care vs self-management)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard care</td>
<td>Self-management</td>
</tr>
<tr>
<td>1.65</td>
<td>0.95</td>
</tr>
<tr>
<td>1.65</td>
<td>1.21</td>
</tr>
</tbody>
</table>

Gadoury, Eur Respir J 30:853, 2005
Self-management education may lead to costs savings

Cost per patient ($)

Integrated Care in COPD

The right therapy for the right patient at the right time:

- Smoking cessation intervention
- Promotion of a healthy lifestyle (increased activity & regular exercise)
- Collaborative self-management strategies
- Optimization of pharmacotherapy
- Oxygen therapy
- Palliative care
“Life is not a matter of holding good cards, but of playing a poor hand well”