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Identifying COPD Patients Near Death

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Identifying COPD Patients Near Death

Abstract
Background: Chronic Obstructive Pulmonary Disease (COPD) is a progressive terminal illness that can hospitalize those with the affliction multiple times during its evolution. COPD often also requires care in the Intensive Care Unit (ICU) and mechanical ventilation with or without intubation. The care provided to COPD patients at the end of their life is invasive and shows a high mortality rate despite full medical treatment. Some patients in the terminal stages of COPD may be aggressively treated with full medical care when their discomfort may be better assuaged by palliative care. There is a great need to identify those patients in the terminal stages of COPD so that the medical community can assist them in dying.

Question: Is there an objective set of criteria that could be used to identify COPD patients who would be best served by treatment with palliative care as opposed to intensive care?

Study Design: Exhaustive search of available medical literature.

Methods: The goal was to find studies relevant to terminal care and critical care of a COPD in the ICU. Ovid, CINAHL, Google Scholar, and Pubmed were all searched for the terms Intensive Care Unit, Chronic Obstructive Pulmonary Disease, and Palliative Care or Terminal Care. Due to the limited number of clinical trials, cohort studies were identified as the best source of information on the dying process of COPD patients. Editorials and reviews were excluded but examined. Studies older than ten years were excluded in order to show the most current state of treatment.

Results: Six studies were identified using the above methods. Five cohort studies using different ICUs and one mixed method study. Age, elevated PACO2 at admission, long-term oral steroid use, a worse exacerbation, worse disease at baseline, any abnormality on Arterial Blood Gas (ABG) analysis, complications during the ICU stay, prior intubations, high serum albumin levels at admission, higher APACHE II score, and duration of hospital stay were all associated with increased mortality, or decreased survival to discharge.

Conclusion: Chronic Obstructive Pulmonary Disease has a high rate of in-hospital mortality; it is the fifth leading cause of death in the United States. The dying process of a COPD patient is painful and not well managed under current treatment regimes. The death of a COPD patient ranks lower on evaluations than other deaths, and there is room for improvement. There is a discrepancy in the care of terminal patients with lung cancer versus terminal care of a COPD patient. This difference may be from the medical providers not identifying those COPD patients within the last 6 months of life or to a higher level of acceptance of hospice care for those patients with lung cancer. Although there is good information about the terminal care of COPD patients in the ICU, further study needs to focus on how to identify terminal patients so that future treatment can be tailored to the individual. There is not an accepted set of criteria that can be used to identify terminal COPD patients who would be best served by palliative care as opposed to intensive care. Table 1 in this study is an objective set of criteria that could be used to help identify those COPD patients in the terminal stages of their disease.

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Identifying COPD Patients Near Death

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A Clinical Graduate Project Submitted to the Faculty of the
School of Physician Assistant Studies
Pacific University
Hillsboro, OR

For the Masters of Science Degree, 15 August 2009

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Clinical Graduate Project Coordinators: Rob Rosenow PharmD, OD & Annjanette Sommers MS, PAC
Biography

Matt was born in Springfield Oregon the son of a local church pastor and grew up in McMinnville Oregon where he graduated from McMinnville High School. After high school Matt joined the United States Air Force as a Crew Chief and spent 4 years in South Dakota. During Matt’s Undergraduate work at Oregon State University, he was also a reserve Crew Chief with the 939th Air Rescue Wing. After graduation, Matt worked full time for the 125th Special Tactics Squadron Oregon Air National Guard until being accepted to Pacific University.
Abstract

Background: Chronic Obstructive Pulmonary Disease (COPD) is a progressive terminal illness that can hospitalize those with the affliction multiple times during its evolution. COPD often also requires care in the Intensive Care Unit (ICU) and mechanical ventilation with or without intubation. The care provided to COPD patients at the end of their life is invasive and shows a high mortality rate despite full medical treatment. Some patients in the terminal stages of COPD may be aggressively treated with full medical care when their discomfort may be better assuaged by palliative care. There is a great need to identify those patients in the terminal stages of COPD so that the medical community can assist them in dying.

Question: Is there an objective set of criteria that could be used to identify COPD patients who would be best served by treatment with palliative care as opposed to intensive care?

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Conclusion: Chronic Obstructive Pulmonary Disease has a high rate of in-hospital mortality; it is the fifth leading cause of death in the United States. The dying process of a COPD patient is painful and not well managed under current treatment regimes. The death of a COPD patient ranks lower on evaluations than other deaths, and there is room for improvement. There is a discrepancy in the care of terminal patients with lung cancer versus terminal care of a COPD patient. This difference may be from the medical providers not identifying those COPD patients within the last 6 months of life or to a higher level of acceptance of hospice care for those patients with lung cancer. Although there is good information about the terminal care of COPD patients in the ICU, further study needs to focus on how to identify terminal patients so that future treatment can be tailored to the individual. There is not an accepted set of criteria that can be used to identify terminal COPD patients who would be best served by palliative care as opposed to intensive care. Table 1 in this study is an objective set of criteria that could be used to help identify those COPD patients in the terminal stages of their disease.

Keywords: Chronic Obstructive Pulmonary Disease, Intensive Care Unit, palliative care, and terminal care.
Acknowledgements

To: Master Gunnery Sergeant S. sleep well brother.
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List of Abbreviations

COPD ................................................................. Chronic Obstructive Pulmonary disease
ICU ................................................................................. Intensive Care Unit
GOLD .................................................. the Global initiative for chronic Obstructive Lung Disease
FEV1 ................................................................. Forced Expiratory Volume in 1 second
Introduction and Background:

Chronic Obstructive Pulmonary Disease (COPD) is a conglomeration of pathologies that destroys the airway lining and other tissues of the lung. The airway lining of healthy lungs is normally composed of many small cilia that help to move mucus and other secretions out of the lung. The destruction of the normal cilia in COPD leads to mucus and secretions staying in the lung and not being expelled. If secretions are not cleared out of the lungs, they slowly accumulate on the lining and can provide a living petri dish for bacteria and other microorganisms to grow in.

COPD may also destroy the alveoli wall resulting in decreased lung surface where the critical exchange of carbon dioxide and oxygen occurs. In more advanced cases of the disease, enough lung tissue has been destroyed that the elasticity of the lung begins to decrease changing the body’s ability to effectively move air in and out of the lung. In the late stages of the disease, enough lung tissue has been destroyed that a patient is no longer able to walk even a few feet without becoming short of breath.

The primary cause for COPD is smoking. Although there are some cases due to second hand smoke or environmental exposures, the majority of the disease presents as a result of smoking. Smoking continues to increase the chance of damaging the lung tissue throughout the life of the smoker. In the terminal stages of COPD, a current smoker is more likely to die from an acute exacerbation then a non-smoker or a former smoker.

The course of a patient with the diagnosis of COPD is progressive, and for the most part irreversible. The state of medical treatment is focused on symptomatic control as opposed to cure. Due to this limitation on our medical management of the disease, even patients with well-controlled COPD who are fully compliant with the treatment plan, still experience significant limitations on their daily activities.

As the patient with Chronic Obstructive Pulmonary Disease nears the end of life, the treatment plan needs to transition from curative treatment into palliation of symptoms. The medical community
serves as a chaperone at the death of many patients. The roll of the medical provider at death is to strive for a “good death”. A death is viewed as good when it is absent of excessive trauma or pain inflicted unnecessarily.16

Many patients who have COPD will be admitted to the Intensive Care Unit (ICU) and may need mechanical ventilation at some point in the evolution of their disease. The ICU also commonly serves as a place to seek terminal care when the patient with COPD nears death.16

The ICU was initially developed as a place to provide rescue care to critically ill patients who were in dire need of exhaustive care that was not available in the general wards of the hospital. The goal of ICU care was to return the patient to health, after recovery from an acute insult.27

The current use of the Intensive Care Unit has several paths, first as a location to die, and secondly as a place to provide rescue care. This dual role places an increased amount of stress on the medical providers in the ICU due to these separate and, possibly, conflicting goals.27

The question is how to best to establish an objective set of criteria that could be used to identify COPD patients who would be best served by treatment with palliative care as opposed to intensive care? Can we identify patients for whom there is not a sufficient prognosis of survival and thus change treatment plans from one of aggressive rescue to one of aggressive palliation?

Methods:

An exhaustive search of the available medical literature in Medline, CINAHL, Google Scholar as well as Pubmed was performed. Key terms of Intensive Care Unit, Chronic Obstructive Pulmonary Disease, and Palliative Care and or Terminal Care were all used. Also reviewed was the literature cited as sources in primary documents. Studies not in English as well as all editorials, and reviews were examined but excluded as primary resources.
Results:

Overall, six studies were identified, four retrospective cohort studies, one prospective cohort study and one mixed method study. Editorials, reviews and studies over ten years old were excluded. The full information on these six studies can be found in table two a summary matrix of studies.

Groenewegen et al. found that age, PACO2, and long-term use of oral steroids were associated with increased mortality in COPD patients after hospitalization for an acute exacerbation. A significantly high mortality rate of 11% in hospital, 43% at one year, and 49% at two years was identified, consistent with other studies of end stage COPD.\(^3\)

Bustamante-Fermosel et al. found that of the patients admitted to the ICU, 96% needed mechanical ventilation support. They also identified that a moderate to severe exacerbation by the Anthonisen criteria, age > 75 years old, a baseline of severe COPD by GOLD 2005, abnormal arterial blood gas results, as well as development of complications during the admission were all independently related to mortality.\(^4\)

Goodridge et al. focused on the quality of the end of life care for a COPD patient in the critical care setting. The quality of death as defined with the Quality of Dying and Death survey rated from zero to 100. Overall, patients with COPD scored a mean of 66.2 out of 100. Patients who died in the ICU from all other causes scored a mean of 71.5 out of 100. Patients with Chronic Obstructive Pulmonary Disease were significantly rated lower in several factors including breathing comfortably three out of ten versus eight out of ten with no COPD. Kept dignity and self-respect five out of ten versus eight out of ten for non-COPD. Spending time with his/her family and friends nine out of ten versus ten out of ten for those without COPD. Visited by spiritual/religious advisor eight out of ten versus ten out of ten for non-COPD patients. Feeling at peace with dying five out of ten versus nine out of ten for patients without COPD. Being unafraid of dying six out of ten versus nine out of ten for
non-COPD. Clearing up bad feelings with others was rated at three out of ten versus five out of ten for non-COPD patients.\(^5\)

Au et al. compared the use of different health care resources in the last six months of life for COPD patients and those with lung cancer. During the last six months of care for terminal patients, those with COPD had a much higher use of primary care, ICU, but a significantly smaller use of benzodiazepine or opiates. There was also a significant cost increase of $4,000 associated with the terminal care of a COPD patient versus those with terminal lung cancer.\(^6\)

Fernandez et al. established that while the use of non-invasive ventilation may help the patient in an acute exacerbation of COPD, survive the hospitalization; it has no long term increase in the survival of the patient. The study also examined the use of a Do Not Intubate (DNI) order as a predictor of 6 month mortality.\(^7\)

Ai-Ping et al. conducted a retrospective cohort study in Singapore of patients admitted to the ICU with an acute exacerbation of COPD. They followed the cohort out to five years to identify mortality causes. Advanced age, prior intubations, long-term oral corticosteroid use, high albumin level upon admission, a high score on the Acute Physiology And Chronic Health Evaluation (APACHE) II score, and longer duration of hospital stay were all predictors of increased mortality.\(^8\)
**Discussion and Recommendations:**

Chronic Obstructive Pulmonary Disease is a progressive disease that evolves slowly over many years, punctuated by acute exacerbations and ending in the death of the patient. The disease can be diagnosed with the use of spirometry or based on symptoms. There may be a failure of communication in primary care to fully express to the patient newly diagnosed with COPD, that the disease is terminal in nature and that unless something else gets him or her first, the disease will. This failure of communication can lead to some unrealistic expectations on the part of the patient.9

There is a need to have the conversation with the patient about terminal care early, and to repeat it often, in every level of care. By addressing death and dying early in the timeline of the disease, poor performance by the medical community at the time of death can be limited. Early discussion of the desires of the patient also allows proper documentation of those desires.

The documentation surrounding death and dying is complex. Some of the most common are a Do Not Resuscitate order (DNR), an advance directive, and a living will. Many patients with terminal illnesses do not have any documentation about what their desires are, and are therefore, defaulted to full rescue therapy.6 Therein lies the danger of our current health care policy; a natural death is no longer the norm.

There is not a significant difference between the desires at the end of life between patents with COPD versus those with lung cancer.9 Even though these two different populations of patients desire the same end of life care, the actual care received at end of life is quite different, with a much higher level of palliative prescriptions and referrals to home hospice given to those patients with lung cancer in the last six months of life.9

One of the major problems with providing quality palliative care for patients with COPD is simply identifying when the terminal stage of COPD actually begins. Other terminal diseases are more
linear with a steady progression towards death. The evolution of COPD is slow and punctuated by acute exacerbations that may be followed by long periods of relatively stability.\textsuperscript{1,10}

This periodic surge of symptoms can lead to a frustrating process for the patient and family who may get called several times a year on behalf of a loved one who has been admitted to the ICU again. This surging disease course may lead providers to not recognizing the terminal stages of the disease and therefore not advocating for palliative care instead of curative treatment.\textsuperscript{10}

Current treatment guidelines and legal obligations in the United States require that anyone who has not specified otherwise be treated to the full extent of our modern medical capabilities. This has been defined as the Rule of Rescue, under which even the most critically ill and terminal patients with little chance of survival is aggressively treated until the medical team fatigues or the medical decision maker for the patient requests that efforts cease.\textsuperscript{11}

The idea that we need to rescue a person who is in mortal danger is an emotional force that drives many medical decisions. Morals and emotions play a major roll in the allocation of healthcare spending, and may even change fundamental treatment ideals. If the allocation of money were looked at with an unemotional eye, and based solely on the cost effectiveness of treatment, the priority would not be on saving a life, it would be on improving health for the largest number of people with the least amount of money being spent. This idea of an un-emotional priority setting for health care is contrary to the morals or mind-set of many people, especially those who work in the medical community and feel a need to heal people.\textsuperscript{11}

The Rule of Rescue care, under which the modern American medical community operates, a natural death must be specifically requested and signed for.\textsuperscript{11} This combined with the misinformation about the medical community’s ability to bring about miraculous changes in the lives of patients results in a disconnect between expectations and reality which can prove disastrous.\textsuperscript{12} This has a particular relevance to terminal COPD patients because they are often intubated in late stages of the disease and are therefore unable to verbalize their full wishes. The burden of medical decision-making
is thereby placed on the next of kin or a court appointed advocate. One of the most common complaints of ICU nurses reporting on the quality of death of the patient, is that the COPD patient is kept alive too long, thereby prolonging the suffering of the patient. There is a risk of harming our patients by aggressively treating a patient in the terminal stages of COPD in hopes of a cure.

Death is a complex process involving many different components, and although no two deaths are the same many share several common themes. In every death there is a physiological component and an emotional component. Everyone involved views those components with a different set of biases and therefore experiences the same event differently.

There is no way to accurately determine if a death was a “good death”. The only person who actually knows that is the decedent and they are most likely not going to fill out a survey form. Questionnaires given to those who observe or participate in the death of the patient are used in the place of actually questioning the patient who is dying. There have been multiple attempts to substitute the patient with a surrogate using the family members, the ICU nurse, the attending physician, and the resident physician. As of now, this is the best source for evaluating the quality of a death.

There is broad consensus that there is room for improvement in the death and dying process in ICUs. Although it is unlikely that there will be a perfect death, there are several areas upon which, we can improve to make the patient more comfortable during the dying process and thereby improve the overall perception of the event.

The question also needs to be asked if the ICU is an appropriate setting for terminal care of patients with COPD. Alternative locations of care for the terminal patient are home, a palliative unit, or the general ward. The location is important but is secondary to the type of care that the medical community is offering the patient.

COPD patients who end up using the ICU during the death process may not fully understand that they have reached the end of their life. Patients often show up in the emergency department
because of an acute exacerbation of their condition and are then admitted to the ICU usually due to a need for mechanical ventilation.\(^4\)

Most people in the world do not die in the Intensive Care Unit. The vast majority of people have no desire to die in the hospital, yet in America, most people with terminal illnesses still end up dying in the hospital contrary to their previously expressed wishes.\(^{13}\) Whether this is a true change in the patient’s own goals or simply, a failure of the medical community to provide adequate home hospice care, is not clear.\(^9\)

The bottom line is, that a patient with Chronic Obstructive Pulmonary Disease needs to understand the progression of their disease. They have a right to know the limitations of the current medical care as well as their options for approaching death. Patients should understand that there is good palliative care available that will provide for relief of symptoms without invasive treatments. Patients need to be in agreement with the treatment plan and to be able to re-verbalize the plan and prognosis.\(^{10}\)

Limitations of studying the dying process are that the quality of information involving end of life issues are not as clear as they are in other areas of medical study. To the best knowledge, there appear to be no randomized controlled trials investigating the admission a COPD patient into the Intensive Care Unit. Many surveys are available that try to judge the appropriateness of care provided to terminal patients, these surveys are clouded by the emotion of the event and therefore may lack the objectivity needed to use as the only source for medical decision making.\(^{3, 5, 6}\)

Some of the information specifically from Fernandez et al was gathered from a community hospital in Spain. The location of the study may have an adverse effect on the results. They identified that the use of a Do Not Resuscitate order was a predictor of death in COPD patients in the ICU. There is a cultural difference in Spain where the majority of people do not use a DNR due to religious or personal reasons.\(^7\)
To date, there are no randomized trials comparing quality of death between rescue care in the ICU care and palliative care for COPD patients. Nor are there any randomized trials trying to identify criteria for admission to the ICU for a COPD patient in an acute exacerbation.\textsuperscript{10} By default, patients presenting to the emergency department in a terminal acute exacerbation, are most likely to be admitted to the ICU due to respiratory failure.\textsuperscript{20} The prognosis of those patients admitted to the ICU is not good, there needs to be a set of criteria in place to channel those patients, in the end stages of the disease, to palliative care as opposed to rescue care in the ICU.
Table 1. Possible Profile of a Terminal COPD Patient:

1. FEV1 < 30% predicted
2. Baseline severe COPD on GOLD scale
3. Reduced ability to perform activities of daily living unassisted
4. 12 min walk no greater than a few steps
5. Recent emergent hospitalization in the last year
6. Left heart failure or other chronic co-morbid diseases
7. Long term oral steroid use
8. Advanced age
9. Depressive attitude
10. Not currently married
11. Currently smoking
12. Elevated C-Reactive Protien
13. Serum total protein
14. Hypotensive at admission

GOLD = Global Initiative for Chronic Obstructive Lung Disease
COPD = Chronic Obstructive Pulmonary Disease
FEV1 = Forced Expiratory Volume in 1 second
Compiled from 1, 3-5, 9, 10, 20-26

Table II primary source matrix

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<th>Author/Title/Journal</th>
<th>Yr. published</th>
<th>Patients/Population</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Outcome(s)</th>
<th>Study type</th>
<th>Validity (Jadad score)</th>
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<td>Groenewegen KH, Schols AM, Wouters EF. Mortality and mortality-related factors after hospitalization for acute exacerbation</td>
<td>2003</td>
<td>COPD pts in acute exacerbation at Maastricht University Hospital</td>
<td>Admission</td>
<td>None</td>
<td>Hospital stay // Mortality</td>
<td>Prospective cohort study</td>
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<td>2007</td>
<td>Fernandez R, Baigorri F, Artigas A. Noninvasive ventilation in patients with &quot;do-not-intubate&quot; orders: Medium-term efficacy</td>
<td>ICU patients with or without DNI</td>
<td>Non-invasive ventilation</td>
<td>In-hospital survival, 6 month survival</td>
<td>Retrospective cohort study</td>
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<td>Goodridge // Exploring the quality of dying of patients with Chronic obstructive pulmonary disease in the intensive care unit: a mixed methods study // Nursing in Critical Care</td>
<td>2009</td>
<td>Deceased COPD pts who died in the ICU</td>
<td>Death in the ICU</td>
<td>Quality of Dying and death survey</td>
<td>“mixed methods study”</td>
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