



COPD's Role in Respiratory Compromise: An Interview with Society of Hospital Medicine's COPD Team

Michael Wong:

Thank you for listening to the Health and Safety Podcasts.

I am Michael Wong, founder and executive director of the Physician-Patient Alliance for Health & Safety. As our listeners may know, the Physician-Patient Alliance for Health & Safety has been at the forefront in raising awareness about respiratory compromise.

The majority of instances of respiratory compromise that occur are often related to the administration of opioids. We have not previously addressed, as sufficiently as we could, respiratory compromise that may have been caused by other patient conditions – such as COPD, OSA, or asthma.

So, today, I am delighted that we are discussing COPD and respiratory compromise.

On the line with me is a great panel of experts from the Society of Hospital Medicine's COPD team:

- Dr Peter Lindenauer, MD, MSc, MHM, is Assistant Dean for Population Health, Director of the Institute for Healthcare Delivery and Population Science, and Professor of Medicine at the University of Massachusetts Medical School – Baystate, and Professor of Quantitative Health Sciences at the University of Massachusetts Medical School;
- Dr. Valerie Press, MD, MPH is Assistant Professor of Internal Medicine and Pediatrics at the University of Chicago.
- Dr. Weijen Chang, MD, SFHM is a Med-Peds hospitalist, Chief of Pediatric Hospital Medicine and Associate Professor of Pediatrics at the University of Massachusetts Medical School-Baystate
- Dr. Joshua LaBrin MD, FACP, SFHM is Assistant Professor of Medicine at the University of Utah; and
- Dr Richard Anthony Mularski, MD is the Director of Northwest Permanente Research and Evaluation and a Senior Physician in Pulmonary/Critical Care Medicine at Kaiser Permanente Northwest in Portland, Oregon

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Wong:

So, let's start with some introductions. Dr Lindenauer, as team lead for SHM's COPD team, let's begin with you. Please give our listeners a brief introduction about yourself.

Peter Lindenauer:

Sure. I'm Peter Lindenauer. I'm a hospitalist at Baystate Medical Center. And, I'm also Assistant Dean for Population Health and the Director of our Institute for Healthcare Delivery and Population Health.

Wong:

Thank you Dr Lindenauer, and Dr Press?

Valerie Press:

Hi. Yes, I'm Valerie Press. I'm an Assistant Professor of Medicine and Pediatrics at the University of Chicago, and I'm also the executive medical director of specialty value based care and lead our COPD readmissions reduction program.

Wong:

Thank you, and Dr. LaBrin?

Joshua Labrin:

My name is Joshua LaBrin. I'm an Assistant Professor of Medicine at the University of Utah, and work as an academic hospitalist, focusing on education and faculty development.

Wong:

Perfect. Thank you, and Dr Malarski?

Richard Mularski:

Hi, I'm Richard. I'm a pulmonary, critical care, and palliative physician working for Kaiser Permanente. I serve as our Director of Northwest Permanente Research and Evaluation, a senior investigator and physician, as well as regional clinical quality lead for COPD and the medical director of our inpatient respiratory care program.

Wong:

Great, thank you so much, and last, but certainly not least, Dr Chang.

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Weijan Chang:

Hi, this is Weijen Chang. I'm a med-peds hospitalist at Baystate Medical Center. I was previously in charge of the COPD readmissions reduction program at U.C. San Diego. Currently, I'm at the pediatric hospital medicine at Baystate.

Wong:

Great, thank you so much for that.

Dr. Lindenauer, please describe for us why COPD is such a burden on our healthcare system and the patient populations that suffer from COPD? And, what was the purpose behind SHM's COPD Guide?

Lindenauer:

Happy to. I think many of your listeners may know patients with COPD, may have friends or family members with COPD, or perhaps themselves have chronic obstructive pulmonary disease. Turns out that at least 15 million Americans have this disease, which is characterized by airflow obstruction and usually presents with symptoms, including shortness of breath, cough and reduced exercise tolerance.

This is a condition that leads to more than 700,000 hospitalizations each year in the US, and has gone back and forth between being the third and the fourth leading cause of death in our country. The costs for caring for patients with COPD has been estimated at 50 billion dollars or thereabouts. And, largely, that is due to the costs associated with exacerbations of COPD. So, the disease that I've talked about, a feature of it is flare ups or what we call exacerbations, which leads to millions of visits to doctors' offices each year, more than a million emergency room visits and, then for the very worst cases, there are hospitalizations.

Once a patient gets hospitalized, what we know is that approximately one in five of those patients will be hospitalized within a month of being discharged and at least amongst elderly with COPD who get hospitalized, the 30-day mortality rate hovers a little under 10 percent. So, this is a very common condition associated with a lot of morbidity and costs to the U.S. healthcare system, and it is one of the most common reasons adults get hospitalized in U.S. Hospitals and therefore is something that as hospitalists and pulmonary, critical care doctors we see day in and day out. So, that kind of describes a bit about the burden of COPD on the healthcare system.

And, a few years back, the Society of Hospital Medicine approached us and said would you like to try and do something for our members and for the hospitals that they practice in that could help facilitate improvement efforts intended to improve the outcomes for patients with COPD. This wasn't just kind of a coincidence, I don't think, and it wasn't just because COPD is a prevalent and costly and a condition with a lot of morbidity and mortality, but the policy landscape has changed over the last five years or so. And, I think there are two factors that kind of catalyzed the interest in this. One was the fact that COPD was added to the list of conditions

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that hospitals are held accountable for through the hospital readmission reduction program the Centers for Medicare and Medicaid Services (or CMS).

So, hospitals, all of a sudden in I think it was 2016, started to be on the hook, if you will, for their COPD admission rates. At the same time, COPD mortality rates, although not linked to any financial incentives, also became publicly available on the CMS hospital compare website, and so again hospitals were now accountable to the public and the press and payers for the outcomes that they were achieving in COPD. And, then, finally there's obviously an enormous shift taking place in the US healthcare system, as we move from a fee for service model to value based care. And, as part of that shift, whether it's through accountable care organizations or other type of financial arrangements, there is a growing recognition that patients with COPD are some of the sickest and costliest patients that an ACO or similar kinds of organizations may be responsible for. And, so I think that was yet another catalyst that has led many hospitals, including as Valerie mentioned earlier in introducing herself and then Richard as well, to say, "hey, we need to be doing something to improve care for patients with a COPD."

And, the Society of Hospital Medicine read those tea leaves and said that we, as the professional organization that takes care of these patients when they're in the hospital, have a responsibility to do something. And, so that's a little bit of the genesis behind the Guide. Again, the Guide is really supposed to be a "how to" for hospital teams that are thinking about embarking on a project to care for patients with COPD.

Wong:

So, obviously there's been many medical organizations like SHM and then there are the GOLD 2017 recommendations, but do you still see a gap between the care given to patients that is recommended by these guidelines versus what's actually being given?

Lindenauer:

Well, that's a great question and on some level it's a hard question to answer, because unlike some other countries around the world, we don't do an audit of practice for patients who are hospitalized with COPD in any kind of systematic and ongoing or regular way. We do have some appreciation of the outcomes nationally, so, we get this sense that readmission rates are unacceptably high. And, that kind of gives us some motivation to look into what might be done to improve those traits. And, then, we can also draw some inferences about quality of care for patients with COPD based on work that Richard Mularski on our on our panel today and our groups independently carried out nearly a decade ago, highlighting gaps in both chronic care and acute care for patients with COPD.

From work that we've done recently, there is opportunity to improve the types ventilatory support that are provided to patients, who get hospitalized. We believe that there are probably opportunities to improve the antimicrobial stewardship for patients who are hospitalized with COPD. There's clearly opportunities to make improvements in our approach to smoking cessation and supporting patients who are continuing to smoke. There's an enormous gap - and Valerie's going to talk about this - in the education that we provide to patients about their use of

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their medication, so it's one thing for us to get the patients on the correct medications - that's a major focus of the GOLD guidelines - it's another thing to make sure that they're actually able to use their medications effectively. And, then I guess the last thing I'll say it is that there's also a tremendous gap between evidence and practice with respect to referring and encouraging patients enroll in pulmonary rehabilitation.

Wong:

That's certainly a lot of gaps for us to look and for listeners to think about. Let's talk about screening for a COPD and every time a patient gets admitted to hospital. Dr. Mularski, you were a co-author of the U.S. Preventive Services Task Force "Screening for Chronic Obstructive Pulmonary Disease." What is the best way to screen for COPD and should that screening be done for all patients admitted to hospital?

Mularski:

Well, screening is a controversial subject among policy leaders and COPD experts. With the prevalence of diagnosed COPD in this nation of almost 14 million individuals and an estimated 12 to 16 million more remaining undiagnosed- that is based on epidemiological studies by NHANES - it certainly makes sense that efforts to identify COPD patients in the general population would be warranted.

As Dr Lindenauer explained, COPD leads to substantial morbidity, disability, impaired quality of life, increased health care costs, and mortality. Even individuals not diagnosed with COPD, who go on eventually to have confirmatory spirometry done, appear to experience impaired health status, problems with activity of daily living, and worse health outcomes. So, screening, at least as defined by the U.S. Preventive Services Task Force, is done to detect early disease in asymptomatic individuals in the general population. It's done especially when early detection and intervention leads to prevention of adverse health outcomes.

COPD is challenging in that those with only mild airflow obstruction may truly be asymptomatic, especially when they lead a sedentary lifestyle that may not provoke dyspnea. Those with more advanced airway obstruction might attribute gradually reduced exercise tolerance, such as being short of breath with activities of daily living, carrying the groceries, climbing stairs, to just being older or being out of shape. It has been identified that patients often reduce activities, but don't report these symptoms or seek medical attention.

Hence, the evidence for efficacy for true screening has not been shown to improve outcomes or prevent disease progression - that is, population based testing of those who truly have no symptoms. But, once spirometry is performed and patients identified to have fixed obstruction consistent with COPD, patients are often not truly asymptomatic, and as we mentioned, don't tell their physicians or providers about this reduced exercise tolerance, even when they see a physician for other reasons or are hospitalized.

Hence, experts advocate for questionnaire evaluations, especially in those at risk. We have to start, for example, with smokers or those exposed to inhaled toxins, like indoor wood stoves.

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There is emerging evidence that pairing questionnaires with peak flow testing might identify those who would benefit from targeted COPD treatment. However, for hospitalized patients, the undiagnosed COPD may be more advanced, [and be] more challenging at the time of hospitalization because other things may be contributing to dyspnea. And, hence, have the need to have coordinated care as an outpatient. For those with suspected COPD, as we recommended in the SHM implementation guide, confirmatory convalescence spirometry is important. This can usually [be] done six weeks or so after hospitalization and should probably be paired with serial measures of respiratory status- that is, a patient reported outcome about their symptoms, such as a COPD assessment test, that can be very useful to guiding subsequent therapy.

Wong:

So, you would recommend, initial testing or are there other tools and assessments that you would recommend be done?

Mularski:

I think especially for hospitalized patients we have to be vigilant to the possibility that COPD is contributing to either their presentation or their underlying symptoms and disease presentation and hence be thinking about initiating some targeted therapy, but most especially ensuring that if one suspects COPD or even makes a clinical diagnosis of COPD that that confirmatory spirometry be done at some point after hospitalization.

Wong:

Sounds like just awareness and being cognizant of the issues would go along way to helping patients who could potentially have COPD.

Mularski:

I think that's absolutely right.

Wong:

So, let's now talk about managing exacerbations, which includes both pharmacological and non-pharmacological therapies. So, let's talk about pharmacological therapies, in particular. Dr. Press, could you tell us the main recommendations regarding pharmacological treatments?

Press:

Sure. For patients who have exacerbations that are hospitalized, there are broad categories of therapies to treat the underlying reasons for the symptoms and then to also heal the patients from the exacerbation and then prevent future exacerbations. One of the main treatments for an exacerbation is corticosteroids or steroids, as we refer to them. This is a medication that can be delivered to the whole body through an IV, through a pill, or even directly to the lungs through inhalers. When patients are admitted to the hospital, if they're very sick, they may get this medication through an IV. But, the way that the body absorbs the medication, it's actually as effective to take a pill, unless they were for some reason be unable to take the pill.

So, what's interesting when we think about the categories of medications for COPD is that there's really only a handful of types of medications and then there are just some nuances on the way they're delivered and their doses.

So, if you want to stick with steroids for a minute, there's been some literature that's come out in the last half decade or so that helped us refine how to use this medication optimally to reduce the risks of side effects from the medication and other side effects, such as problems with an IV site. So, actually Peter Lindenauer, a member of our panel, has done some work looking at both the ideal dosing, route, and then also the length of time for the steroids to control that exacerbation. So, in one of the studies that he and colleagues looked at, they looked at what is often done, which is come into the hospital with a COPD exacerbation and patients often get put on very high dose IV steroids. He actually compared that to lower dose or even low dose steroids through pills, and found that these low dose oral pills were just as effective for most patients.

And, I think that this is really important, because there are obviously side effects with any medication that you take and limiting the dose can be really important, and then there's also the side effects with anything when you puncture the skin, so limiting IV route is also really important. But, what's also interesting is that when you think about continuing the steroids for the length of exacerbation, there had also been a longstanding practice to provide those medications for a great deal of time - sometimes as long as two weeks - and what other colleagues in the field have done, was to look at whether you could actually use a shorter five day course rather than that longer a 14 day course, and they also found that this was a recommended treatment for most patients. And, again, when patients take steroids for prolonged times, it can be difficult to come off the steroids. And, so, short courses can be effective to treat the current exacerbation can limit those longer term risks. So, that's one of the main therapies.

There are buckets of therapies. The airway has smooth muscles in them and those are reactive in this situation and can cause constriction. And, so there are medications that can target the airways to relax the smooth muscle. Those are things like beta agonists, anticholinergics, and other types of medicines. One of the more common medications that people talk about is albuterol and then there's also Atrovent - those are just a couple of names of medications.

These medications actually have short acting forms and long acting forms, and so patients may be on controller medications at home before coming into the hospitals on the longer acting medication. When you come into the hospital, they are often placed on these short acting medications. And, again there's a delivery route, so you can deliver the medications both through a nebulizer mask treatment or via these inhaler devices that can be hand held and patients can use wherever they are. And, in the hospital a long standing tradition has been to deliver these medications through nebulizer therapies. And, the patients often experience this nebulized treatment as feeling as though this is a stronger treatment, but when it is delivered correctly through the inhaler, it can be just as effective as the nebulizer therapy. And, this is an important note to mention because as has already been alluded to by Peter and others on this

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panel, patients often do have difficulty in using their inhalers correctly, which you can talk about more. So, if patients are hospitalized and having an exacerbation that could be a very good time to be trained on how to use their inhalers and to practice that. But, if they're only prescribed a nebulizer format, during their hospitalization, they're not going to have that opportunity for the training and practice.

And, there was a great study called "Nebulizers No More After 24" by Chris Moriates when he was at University of California San Francisco that actually looked at this. And, this was a very important high value case, because not only patients have that opportunity for learning, but it could actually be have higher value cost appropriations for hospitals to use the respiratory therapists when needed for nebulizers, but not when patients could use their metered dose inhalers.

So, again, in summary, we've talked about two therapies so far - the steroids and those can be delivered IV, oral, or directly to the lungs, and then these smooth muscle relaxer medications that can be delivered through nebulizers or through inhalers. There's already been discussion about antimicrobial stewardship and antibiotics and some patients with COPD do require antibiotics for their exacerbation, but not all patients, and there is some data in the literature that say that we don't always get that right and so there could be more there could be more attention paid to antibiotics. There are a whole list of medications, but, in terms of broad strokes for pharmacologic therapies, those are some of the standard treatments.

Wong:

Thank you, and let's talk a little more about inhalers because often patients are sent home or discharged from hospital with an inhaler. And, obviously it's important for the physician and the patient to make sure the patient knows how to use them. And you authored two research papers on inhaler use - one "Misuse of Respiratory Inhalers in Hospitalized Patients with Asthma or COPD" and one "Teaching the Use of Respiratory Inhalers to Hospitalized Patients with Asthma or COPD: a Randomized Trial." What advice would you give to patients and their physicians about inhalers and making sure that patients know how to use their inhalers properly?

Press:

I've been looking at this question, so I appreciate the opportunity to discuss it. I think that if I had one shot at patients and providers, I would say at least know that inhaler technique is a problem. I've studied this and I know that patients aren't always aware that they're not using their inhalers correctly and providers across the board often don't realize this, as well. We often, as physicians or nurse practitioners, write prescriptions and don't realize that patients aren't using their inhalers correctly and how tricky it can be to really get the medicine from the inhaler device into the lungs. There are lots of different inhaler devices out there. They each have their own unique sets of steps and tricks to use them correctly. Sometimes if you are taught about one device and trying to use that information for another, it could be in direct conflict.

A great example of that is with a metered dose inhaler. It is pressurized, so when you press the inhaler device, the medicine is released very, very quickly and patients really need a device that we often refer to as a spacer device to allow timing to get into the lungs. Patients often don't

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have that spacer device and their natural instinct is to breath in too quickly and they really need to breathe in slowly to get that medicine into their lungs.

There are other inhalers and they have dry powder in them. These in contrast actually require patients to take really brisk, strong breaths in to get that medicine into their lungs. And, so you can see how different techniques need to be applied differently for that the type of inhalers.

So, in talking to patients and providers, I think the number one step is just awareness that it's a problem to not assume that patients are using them correctly and what I see all too often is that patients come in and we take medication history and, if we see in the computer or a patient tells us what medicines they're prescribed, we assume that they are (a) taking them at all and (b) if you're taking them that they're doing it correctly and what we might do is just up their therapy and add another medication on or increase their dose, without stopping to realize that maybe the medicine isn't getting into their lungs in the first place and that they might not need that escalation. So, I think those are some of the main messages.

I think it takes practice would be the other one. So, if you do take the time to teach the patients to use their inhaler and they show you they can use, just remember that they may go home and back on some old bad habits, because that's what we do when we learn something wrong the first time. And so it just needs to be repeated really. Any healthcare encounter where you're working with the patient and they have COPD, it's good to check in and watch them use their inhaler devices and teach them appropriate step.

Wong:

Seems like we could spend a whole whole podcast or even a series podcasts on how to use and inhalers correctly. Thank you so much for those great points. And, Dr Mularski, you co-authored the paper "Patient characteristics associated with poor inhaler technique among a cohort of patients with COPD." Are there certain types of patients that you have found to be more in need of more education for inhalers?

Mularski:

Well, certainly as inhalers are the mainstay of COPD therapy and as Dr Press emphasized it's imperative that we repeatedly assess and ensure that the inhalers are used correctly. Maybe we should have a full podcast just on the subject. The collaborative work that you reference from our COPD outcomes based network for clinical effectiveness and research translation (or CONCERT), which is led by Anne Melzer, examined characteristics of COPD patients as well as devices that were associated with poor inhaler technique. Approximately two thirds of folks in the study demonstrated poor technique for at least one device.

Characteristics that were associated included African-American race, lower education, and especially the metered dose inhaler device, as Dr Press was mentioning often requiring a spacer and specific education around the timing, which can be much more difficult for instance for elderly patients or those with any cognitive limitations.

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Hence, tailored education interventions to teach inhaler techniques should be but part of the process of initiating but certainly in monitoring inhaled therapies. There's a great opportunity to pair inhaler technique education with disease management programs, especially those that also address action plans, airway clearance techniques, probably most importantly provide a transition to post-hospital support - that might include, for instance, care management that reassesses and reinforces all of these aspects of COPD therapy, but as we heard especially proper inhaler use.

Wong:

And, obviously if none of this is done, then you're going to get readmissions. So, let's talk about readmission for COPD. Dr. Chang, you have studied the problem of readmission rates in patients with COPD, and have done research that suggests it's not the quality of care in the hospital that's critical to keeping COPD patients healthy. What did your research tell you about what hospitals and clinicians should do to reduce readmissions for COPD?

Chang:

Readmissions for COPD is a very complex topic. And, I know that, if you're looking at readmissions for choose your medical illness and symptoms, you have a great sense of frustration, if you're in charge of that for your institution.

But, the factors that we think about for readmission include core control for other comorbidities, worsening severity of the underlying COPD, poor adherence to their inhaled or non-inhaled medications, continued smoking, of course smoking cessation, poor nutrition especially in advanced COPD, and maybe most importantly underlying socio-economic issues. Interestingly, we actually did do an audit of COPD care in our institution - this is at that UC San Diego before I came to BayState, having not quite going yet broken into the inner circle of COPD care at BayState yet (you'll have to talk to Peter about that), we found that actually we were only delivering ideal care for COPD 60 percent of the time in the hospital. And, that's defined as administering all the recommended therapies and none of the non- recommended therapies according to the GOLD literature.

What we did find is that when we utilized a clinical pathway and order set for COPD, we were able to increase ideal care from 60 to over 90 percent of patients who were hospitalized. However, during that 30-month period, we also found that the patients who were on the order set and pathway really didn't have much difference in their clinical outcomes- they had a slightly lower length of stay, slightly lower 7-day readmission rate, but not much difference in their 30-day readmission rates. This is with QI project that we also tried to institute an airway clinic, as well as improved connection to the airway clinic, in terms of follow up. And, we did find made for the patients who made it to the airway clinic as an outpatient, their readmission rates were much lower, down to 16 percent.

So, what we have found in that study, as well as other studies since then that are in the literature, that connecting patients to outpatient care is really critical. Some other studies have looked at discharge bundles - there have been mixed results with that. I think the big promise

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down the line is going to be in transitional care, however, and especially population and disease management. There maybe something also in the new ACO paradigm of care for improving the underlying social economic state of our patients and some way shape or form, whether it's housing or access to transportation, because those are I think very critical factors to readmissions as well and not just for COPD for other comorbidities.

Wong:

Obviously managing acute exacerbations is critical, and I know there's been some debate about using antibiotics in acute exacerbations. Dr. LaBrin, I know you've done some research on this, would you care to comment on that?

Labrin:

Sure. As Valerie already mentioned earlier, again with steroids and bronchodilators, there are lots of good data on the effectiveness of treating and using those in the management of acute exacerbations of COPD. There's more controversy when it comes to antibiotics - they are not recommended as preferred therapy for all patients, yet if I pick up a service and there are patients with COPD, more often than not they are on antibiotics. And, the reason for that is because there is some literature that suggests that there is improvement in treatment failure, mortality and other adverse outcomes when people are on antibiotics.

However, we also know epidemiologically that 50 percent of all patients who have COPD exacerbations are from a bacterial cause. That means that the other 50 percent are not from a bacterial cause. And, especially with this recent flu season, we've definitely had folks with significant viral illnesses that have had significant associated COPD exacerbations, as well. So, when we are thinking about using antibiotics, we need to think about the use of clinical indicators, such as some of the cardinal criteria that we think about - increased dyspnea, sputum purulence, sputum volume. And, there's literature to suggest that folks that have all three might benefit more from antibiotics than those who have none of those, and specifically looking at sputum purulence as being a good marker of a bacterial etiology for that COPD exacerbation.

Sputum cultures are not always that helpful when we are looking at COPD exacerbations, because many of our patients with COPD have colonization of bacteria in their airway already that may confound the results and in terms of management, they confound that for the provider, as well. We also need to think about co-morbidities, severity of illness. So, if they're intubated in the ICU, we're more likely treat them because they're more likely to have a bacterial etiology for that exacerbation. More recently, I think folks are using potential biomarkers - CRP, procalcitonin to potentially see if that would help with guiding therapy and there are some institutions that are using procalcitonin-based algorithms to help in guiding their use of antibiotics.

Again, there's some literature out there that suggest that but, again, some of that is also with its limitations in terms of whether they are small studies, there are meta-analyses, with potential for bias. And, so again, the GOLD Guidelines still don't recommend those systems fully and that is

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something to consider in terms of being better stewards of our antibiotic use. And, using these types of algorithms may help limit the amount of antibiotics that we use, but also while not giving up on the amount of efficacy, or benefit of clinical outcomes for our patients with COPD exacerbations. And, finally the literature does suggest that, in terms of length of therapy, a five day course of oral antibiotics is recommended for treatments with acute exacerbations of COPD.

Wong:

Excellent. In conclusion, Dr Lindenauer, what do you see as the highest priorities for hospitals and clinicians to look at when treating COPD patients?

Lindenauer:

I am impressed by all of the information that the panelists have already shared. To summarize it, I think what you've heard is, that getting patients on the right medications- whether that antibiotics, steroids, or respiratory inhalers is key. But, what is also key and probably an area where again we have a big opportunity to improve how we do things in the hospital is improving our approach to teaching inhaler use. It doesn't bode well to give people the right prescriptions, if they don't know how to use them. The two things that we didn't talk about which I think I'd like to at least highlight briefly. Is the idea of pulmonary rehabilitation and I mention it very briefly at the beginning of our call. But, we know that pulmonary rehabilitation improves the lives of patients with COPD, it reduces symptoms and improves quality of life and exercise tolerance. And, yet, they're only trivially small percentage of patients who have moderate to severe COPD, the kind of patients who get hospitalized, end up getting into pulmonary rehabilitation programs. And, that is, also clearly a missed opportunity. And, the other thing I wanted to mention, which we haven't had a chance to touch on is, the importance to co-morbidities, and that was I think one of the chapters in our toolkit. The bottom line there is that, for the most part, it's the rare COPD patient who only has COPD, and, so these are individuals who are dealing with often times with cardiovascular disease, heart failure being particularly common, and as well as depression and anxiety. A hospitalization is particularly good time to kind of step back and take a careful look across all of the systems in the body that are contributing to a person's overall health and their likelihood of successfully navigating the next month or six months after they're discharged. And so, I would also just emphasize the importance of carefully considering other co-morbidities and their contribution. And, I think if hospitals can address those things, using some of the tools that we've heard about - pathways, checklists - that we could really move the needle on COPD outcomes, which have been rather stubbornly stuck for a long time.

Mularski:

So this is Dr Mularski. And, I think Dr Lindenauer nicely summarized priorities, especially during hospitalization. But, I think it's equally important to emphasize that we're not just talking about disease management for COPD, but we're talking about care of persons. Two ends of the spectrum - we need to emphasize the whole person management one is in preventing further adverse events and something we didn't get a chance to talk much about is smoking cessation, especially the opportunity during the hospitalization to engage the patient more fully and ensure that in improving the transition, if they are an on-going smoker to really facilitate cessation. At

the other end of the spectrum, is to talk to patients about palliative and end of life care, when appropriate. As Peter described, patients with COPD often have complex chronic conditions and it's important to review patients goals of care. Ask questions like what will be the experience like for the next hospital admission, is the disease such that mechanical ventilation might be necessary and the possibility that one may not be able to come off mechanical ventilation. What do people want as their preferences and goals and then to provide recommendations that align with the patient preferences.

Thank you so much, Drs. Lindenauer, Peters, Mularski and Chang for your great insights and advice regarding COPD - and thank you for joining me on this podcast. I would encourage you to read the Society of Hospital Medicine's COPD Guide, which is an excellent resource for clinicians to manage COPD in their patients.

I would also encourage you to read the 2017 recommendations from the Global Initiative for Chronic Obstructive Lung Disease (or GOLD). The GOLD recommendations are the premiere evidence-based reference tool for the implementation of effective disease management plans, and represents the current best practices for the care of people living with COPD. The 2017 GOLD guidelines weigh in on numerous other aspects of the medical management of COPD.

As we have discussed in some detail inhalers, which involve patients learning how to use them properly and appropriately, I would like to emphasize what GOLD has said about inhalers - and this is particularly for patients or patient families listening in - "The choice of inhaler device has to be individually tailored and will depend on access, cost, prescriber, and most importantly [the] patient's ability and preference." In short, please speak with your doctor to determine the best course of treatment for COPD.

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I would like to thank Sunovion for their generous support of this clinical education podcast. Through the financial support of Sunovion, the Physician-Patient Alliance for Health & Safety can offer this podcast with full independent control over all programmatic and editorial aspects of the podcast, including selection of clinicians to be interviewed, discussion topics, and questions asked.