Proceedings from a special symposium on

Improving Symptom Control in Patients with Chronic Respiratory Disease

Presented at the 54th International Respiratory Congress of the

American Association for Respiratory Care

December 2008 • Anaheim, California

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Foreword

Improving Symptom Control in Patients with Chronic Respiratory Disease

Timothy R Myers RRT-NPS
AARC President

From that small group of Dr. Edwin Levine's students and other interested doctors, nurses, and oxygen orderlies that met at the University of Chicago Hospital to form the Inhalation Therapy Association (ITA) in the Summer of 1946, the American Association for Respiratory Care (AARC) has grown immensely since its inception. The AARC in its 6th iteration has had a proud and distinguished history over the past 60 years and now stands strong at over 49,000 members.

In addition to offering a full range of services, programs, products, and money-saving opportunities to meet the respiratory care communities' needs, the AARC's major emphasis has been and will always remain the same—helping the respiratory therapist grow and develop through a multitude of educational programs and projects.

Since 1947, the AARC has been committed to enhancing the respiratory therapist's professionalism, improving performance on the job, and helping broaden the scope of knowledge essential to the profession's success. Education is the *raison d'être* for the existence of the AARC, and has been since its organizational inception in 1946. A key purpose listed in the Articles of Incorporation of the newly chartered ITA was "To advance the knowledge of Inhalation Therapy through institutes, lectures, and other means." Contemporary amplification of that purpose is codified in Article II, Section 1 of the AARC Bylaws that reads, in part, "The Association is formed to: Encourage, develop, and provide educational programs for those persons interested in respiratory therapy and diagnostics hereinafter referred to as Respiratory Care."

Chronic respiratory diseases are generally considered to be chronic diseases of the airways and other structures of the lungs. The most common respiratory conditions are typically asthma, chronic obstructive pulmonary disease (COPD), respiratory allergies and occupational lung diseases. Chronic respiratory diseases are those conditions that are present for months to years, and are treatable but generally not curable.

Chronic respiratory diseases are not only widely prevalent, but come with considerable costs in their daily morbidity and high potential for mortality. Cancer will kill an estimated 160,000 in 2009 while COPD is the fourth leading cause of death in the United States (behind heart diseases, cancer, and stroke) and now kills about 140,000 Americans annually. While respiratory disease mortality catches everyone's attention, the daily functional morbidity of COPD and asthma go largely unmentioned. Experts estimate that about 30 million Americans have COPD (only 50% have been evaluated and diagnosed), while asthma prevalence is estimated to run at approximately 22 million. The total economic impact of COPD in the country is estimated to be about $31.9 billion annually.

While the medications to treat and manage these diseases are generally quite effective, there are innumerable issues in them being accessible to patients and then being administered and used to their maximum efficiency. A breakfast symposium titled *Improving Symptom Control in Patients with Chronic Respiratory Diseases* from the 54th International Respiratory Congress in Anaheim, California in December 2008 provides four articles that all deal with various issues of compliance and non-adherence and potential educational interventions.

Through unrestricted educational grants from the AARC's Corporate Partner community, the AARC has

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the ability to bring contemporary educational topics and continuing education at no costs to its members. These types of educational projects and resulting products are at the core of the AARC's Mission and Vision for the respiratory care profession. We hope that you enjoy the four articles from nationally recognized speakers and take advantage of the free CRCE by completing the post-test.

Why Patients Stop Taking Their Controller Medications

Patrick J Dunne MEd RRT FAARC

Introduction

One of the major challenges clinicians face when providing care to patients with a chronic respiratory disease is convincing the patient (or caregiver) to continue to take prescribed controller medications when symptoms associated with an exacerbation have been resolved. It seems that once the crises has passed and breathing returns to a relative degree of normalcy, there is no longer any urgency to take medications, or in some cases, to no longer even think about the chronic condition. Unfortunately, as is very obvious to most respiratory therapists but less so to our patients, chronic respiratory conditions are never completely cured. Instead, our clinical objective is to control, to the degree possible, the signs and symptoms of a particular disease to minimize the discomfort and disability for each patient.

To that end, patient or caregiver "buy-in" and active participation in the sustained self-administration of prescribed controller medications is essential. However, recent data clearly shows that this is not the case, and alarmingly, is probably more the exception as opposed to the rule. Simply stated, patients are not inclined to continue to take controller medications once the urgency, discomfort or fear associated with symptom flare-ups has passed. There is a substantial amount of recently published material addressing the issue of "non-compliance" with prescribed medications, not to mention similar concerns over certain home respiratory devices such as long-term oxygen therapy equipment or positive airway pressure machines. The clinical and economic impact of non-compliance is staggering and is addressed elsewhere in this monograph.

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Is it *compliance* or *adherence*?

Traditionally, the word *compliance* has been used to describe a patient's behavior with respect to the degree that they actually take a controller medication or use a respiratory device according to the schedule and doses prescribed by their provider. On the other hand, *non-compliance* describes the opposite - - disregard for the provider's intended self-care. Non-compliance can be either complete (in which case nothing is taken or used) or partial (in which meds are taken or equipment is used erratically). In either case, effective symptom control is compromised.

In an attempt to try and address why sustained compliance remains such a problem, there has been a recent flurry of articles suggesting that the word *compliance* itself might be part of the problem. One of the best was authored by Joseph Rau and published in Respiratory Care in October 2005.[1] In his article, Dr. Rau provided a nice review of how the word *compliance* has been described in the medical literature. For example, Haynes and colleagues authored a complete textbook on the subject, defining *compliance* as "the extent to which a person's behavior, in terms of taking medications, following diets or executing lifestyle changes, coincides with medical or health advice".[2] In 1995, Tashkin writing in Chest, described *compliance* as ". . . nothing more than simply following the instructions of a health care provider"[3]. Citing several

other similar descriptors, Rau concluded that the word *compliance* ". . . has the connotation of a person giving into a request or demand", arguing that the term implies a passive, disinterested, and at times, stubborn, participant simply following orders.

As a contrast, Rau describes the work of Rand and Wise, who, in 1994 advanced the notion of using the word *adherence*, describing it as ". . . the degree to which patient behaviors coincide with the clinical recommendations of health-care providers".[4] Supporting the adoption of this softer, gentler word, in 2001 Lewis and Fink suggested that *adherence* "…describes an active patient who is an empowered partner in his or her own care".[5] Further, in 2003, an international team writing under the auspices of the World Health Organization to address poor disease control in both developing and developed countries, stated the following "The idea of compliance is associated too closely with blame, be it of providers or patients, and the concept of adherence is a better way of capturing the dynamic and complex changes required of many players over long periods to maintain optimal health in people with chronic diseases".[6] This led Rau to conclude that the word *adherence* ". . . describes the degree of agreement between prescription and practice". Others have concurred and we now see a definitive movement toward the use of the word *adherence* to describe the degree to which patients with a chronic respiratory condition take their prescribed medications or use their respiratory devices as intended by their respective health care provider. In this context, *adherence* implies an activated patient who willingly accepts their role and responsibility for providing self care on a daily and sustained basis.

Engendering sustained patient adherence is also central to the basic tenants of chronic disease state management. Disease management is a medical care strategy increasingly being recognized as an important way to reduce rampant recidivism - - frequent re-admissions due to exacerbations that are not only costly but at times, may be life-threatening. It is now commonly accepted that a majority of such re-admissions are often avoidable, especially when prescribed controller medications and/or home respiratory devices are used properly on a sustained basis.

This of course begs the question as to why respiratory therapists should be concerned about patient adherence with prescribed respiratory medication or device regimens. Well, aside from the obvious clinical advantages to our patients, there are economic imperatives as well. For example, writing in Chest in 2000, Cochrane noted that ". . . with any chronic disease, patient adherence is an important determinant of therapeutic success".[7] In 2004, Bender and Rand noted that ". . . patient non-adherence to treatments for chronic illness compromises treatment success and patient quality of life while increasing health care costs".[8] This led Rau to state unequivocally that ". . . patient non-adherence with prescribed inhaled therapy is directly related to increased morbidity, mortality and costs"[1]. One would hope that these points aptly underscore why respiratory therapist, regardless of practice venue, should never pass on an opportunity to discuss with their patients and/or caregivers the importance of appropriate and sustained use of prescribed controller medication and/or respiratory devices. As the incidence of chronic respiratory diseases continues its alarming increase in this country, this imperative becomes all the more important, especially as the US health care delivery system is now poised to undergo, what some are calling, a radical transformation. As this undertaking materializes, there is no doubt that significant attention will be focused on the huge economic burden associated with chronic medical conditions and the sub-par manner in which they are treated and managed.

Most Common Respiratory Controller Medications

In terms of chronic respiratory diseases, the list of controller medications is relatively short, and the various medications are often disease specific. It should also be noted that the role of prescribed controller medications is now clearly established in evidence based practice guidelines, as is seen in the latest iterations (2007) of the National Asthma Education and Prevention Program (NAEPP) as well as in the 2008 GOLD Guidelines for COPD.[9-10] For example, with chronic asthma, the most important controller medication remains low-to-moderate doses of inhaled corticosteroids. On the other hand, for COPD, the controller medications of choice are long-acting bronchodilators (both beta agonists and anticholinergics), and for those patients with advanced, very severe COPD, long term supplemental oxygen therapy. However, when a single controller medication fails to provide effective symptom control, physicians often decide to use combination therapy, such as an inhaled corticosteroid and a long acting beta agonist. Fortunately, for our patients, there are now pharmaceutical formulations containing both medications in a single dose, making adherence inherently easier since only one administration is needed instead of two or three. Nonetheless, whether it be mono or combination therapy, controller medications are only effective if patients and/or caregivers continue to remain adherent, especially when symptoms are no longer in evidence.

Types of Non-adherence

When attempting to describe non-adherence in order to establish an effective remedy, it is helpful to consider it as a range of behaviors, from incomplete to total nonuse. It is likewise useful to also recognize that there are two broad categories of non-adherence – intentional and unintentional.[11] Intentional non-adherence occurs when a patient or caregiver understands the purpose and importance of prescribed controller medications, but for a variety of reasons to be discussed below, intentionally decides to stop taking their medications, or in the case of a positive airway pressure machine, to stop using the device during sleep. Factors that contribute to intentional non-adherence include: forgetfulness (especially so with the elderly population), stress - resulting from a busy family and/or work schedule or financial uncertainty, overly complex or demanding aerosol regimens, and even psychological factors such as depression.

Unintentional adherence, on the other hand, occurs when patients or caregivers do *not* have a clear understanding and/or appreciation of the role of a controller medication, or what is probably more common, how to correctly use the medication delivery device, such as a metered dose or dry powder inhaler. Factors contributing to unintentional non-adherence include: language or cultural barriers, improper prescribing, misunderstanding of the prescribed regimen or incorrect or incomplete teaching by the health care provider.

Unfortunately, these two types of non-adherence are not necessarily mutually exclusive, adding yet another challenge to those clinicians grappling with the negative consequences of non-adherence. Fortunately, as is discussed elsewhere in this monograph, we now have a much better handle on addressing unintentional non-adherence, leaving us to address here the reasons why patients/caregivers intentionally decide to stop taking their prescribed controller medications or from using their prescribed positive airway pressure machines.

Causes of Intentional Non-adherence

Table one lists the most common reasons that patients willfully decide to stop taking their controller medications. Although not necessarily exhaustive, it does provide a rather comprehensive listing of the reasons (or, as some might argue, excuses) patients offer when confronted with non-adherence. Regardless of whether or not one agrees or disagrees with the various reasons, central to this issue is that patient/caregiver beliefs, no matter how far-fetched they may seem to the health care provider, must not be discounted.

Reasons for Intentional Non-adherence

- Concerns about adverse effects
- Medications are too expensive
- Not really that sick
- Not wanting to get "hooked"
- Medications no longer work
- To gain attention

Table 1

To set the stage for subsequent articles in this monograph that will provide more specific recommendations and "tricks of the trade" on engendering sustained adherence, at this point we will merely discuss each reason and provide a commentary as to the validity of each.

Concern over Adverse Effects

Concerns about adverse effects are well-founded, especially with parents of children with chronic asthma. The term "steroid-phobia" nicely captures the concern parents have when long-term use of inhaled steroids is prescribed for their children. To underscore the pervasiveness of this concern, it has been reported that 65% of new prescriptions for inhaled corticosteroids are *not* refilled, clearly demonstrating that this particular controller medication, in spite of overwhelming evidence of its relative safety and effectiveness, is woefully underutilized in the management of chronic asthma. In most instances, parents equate the adverse effects reported with the indiscriminate (not to mention illegal) use of oral or parenteral steroids, especially by certain athletes seeking an unfair competitive advantage. What is unfortunate is that we now know that the inhalational route of steroid administration, when properly prescribed, does not necessarily equate to HPA axis suppression (i.e., growth retardation), bone density issues or exogenous Cushing's syndrome. Respiratory therapists are indeed the best qualified to address steroid-phobia by stressing the safety of the inhaled route and the long-term advantages associated with keeping asthma inflammation under control.

Medications are too Expensive

Unfortunately, the number of Americans lacking effective health care coverage for their medications – either non-insured or under-insured – is staggering. When patients, parents or caregivers are forced to choose between food and shelter or controller medications, for obvious reasons, food and shelter will always win. Few will deny that the existing US health care system is in trouble and access to affordable prescription

medications will be only one of the myriad issues facing the Obama Administration as they attempt to overhaul what many now believe is a dysfunctional and out-of-control industry. In the meantime, we are obliged to work within the existing system and to do all that we can to help our patients have access to these important medications. One source of potential assistance could be working with medical social workers who may have insight into alternate funding sources. Moreover, since many pharmaceutical firms offer rebates or special pricing for low income patients, this may be a path worth exploring to help counter this very real concern.

Not Really that Sick

When patients are initially diagnosed with any chronic medical condition, let alone a chronic respiratory disease, one of the first reactions is denial. This is an all-too-human response, especially in a society that is constantly being bombarded with video and digital images of youth, vigor and vitality. Few, if any of us, welcome the news that we have a chronic medical condition, but the reality is that many Americans are indeed afflicted with one or more chronic conditions. This is especially so as the elderly portion of the population continues to expand, but younger Americans are vulnerable as well. Of major concern to respiratory therapists is chronic asthma, where denial can lead to death. The problem is that when asthma symptoms of bronchospasm and inflammation are under control, the individual may literally be asymptomatic and experiences little discomfort. This is where denial rears its ugly head, or as the old adage goes "out of sight – out of mind". It is therefore important for respiratory therapists to have frank and candid discussions with their patients afflicted with asthma, COPD, or even OSA. The focus of the conversation should be on the stark difference between effective long-term symptom control and a 100% cure. The former is attainable, whereas the latter is not.

Not wanting to get "Hooked"

It is probably safe to assume that the great majority of human beings do not readily welcome the possibility of dependence or addiction to a chemical preparation. Such aversion is reinforced with daily and often sobering accounts of the horrendous effects of illegal drug addiction and the human toll extracted by this blight on society. However, even with safe and properly prescribed medications, dependency is disruptive and often imparts a major impact on daily living. In a word, it is something else to worry about in an already full and increasingly complex life. Couple this fact with the perception described above that "I'm not really that sick", it is easy to see why patients offer this reason for deciding to stop taking their medications. Again, respiratory therapists have a unique opportunity to discuss the differences between dependency and the successful long-term control of symptoms, stressing the harm (not to mention danger) of off-again on-again regimens. An effective counter to this very real yet specious patient perception would be to stress that the eventual goal is to achieve an improved overall quality of life.

Medications no Longer Work

One of the most common explanations for this reason is that patients often confuse the difference they experience when taking a dose of the newer long-acting beta agonists instead of a short-acting, rescue beta agonist. This is especially so if a short acting beta agonist had been used on a scheduled daily regimen for symptom control, as was often the case before the longer-acting versions became widely available. Specifically, the tremulous and/or tachycardia experienced with the inhalation of a short-acting beta agonist is often perceived, and becomes synonymous, with the fact that the drug is working. In another example, when a regimen of inhaled corticosteroids is successful, subsequent doses may not be perceived as having any impact, as their role is now more preventative.

It should be noted that even today, there are still many prescribers who continue to prescribe, albeit in direct contravention to evidence-based guidelines, a daily regimen of short acting beta agonists, when in reality, this class of drugs are now only to be used on an as needed basis when there is an acute onset of bronchoconstriction. Consequently, whenever a patient is being converted to one of the newer, long-acting beta agonists, it is essential that the respiratory therapist anticipate this patient response and instruct the patient accordingly.

To Gain Attention

This rather subtle yet real problem is typically seen with young children and adolescents, who, for one reason or another, decide (intentionally or unintentionally) to use their disease as a way to try and control parental behavior. This patient population learns very quickly and at a relatively young age that a medical condition

can be used for manipulation purposes. It may be as simple as having an excuse to not go to school or church, not wanting to play sports or be involved in outdoor activities. Or, it could be something much more complex such as deep rooted psychological issues or ill-founded feelings of abandonment or estrangement. In either case, it is important that parents realize, especially with asthma, the possibility the a recurrence of symptoms may indeed be the direct result of the child willfully deciding, in spite of the risks, of not taking their medications as directed. Parental supervision is therefore an important part of ensuring sustained adherence.

Summary

Patient/caregiver non-adherence with prescribed medications to control respiratory symptoms is an increasingly problematic challenge, made all the more critical because of the adverse clinical and economic impact. Non-adherence leads to poor disease control and an increase utilization of re-current and costly emergency care. On the other hand, effective symptom control, achieved through willful and sustained adherence, offers our patients an improved quality of life in spite of their chronic respiratory condition. Respiratory therapists possess all of the skills, attributes and talents needed to help foster sustained adherence, and there is no shortage of opportunities to do so. While providing patient education (and motivation) may not provide the adrenalin rush as working in a hi-tech pulmonary critical care setting, it is as every bit as important to the lives of those patients who continue to struggle with daily bouts of dyspnea and wheezing. It is a patient population that we should embrace and work with in every practice venue. The end results could indeed be remarkable in a very short period of time.

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The Impact of Non-adherence with Respiratory Controller Medications

Russell A Acevedo MD FAARC

Introduction

The medical profession has known for some time that non-adherence with prescribed controller medications is a major problem leading to poorer clinical outcomes, increase costs and worsening of the quality of life. The general public is now also learning about non-adherence and its implications. On October 22, 2008, The New York Times ran an article on the dramatic drop in the number of prescriptions filled in 2008 (fig. 1). No doubt, this drop coincided with the major financial downturn of 2008.[1]

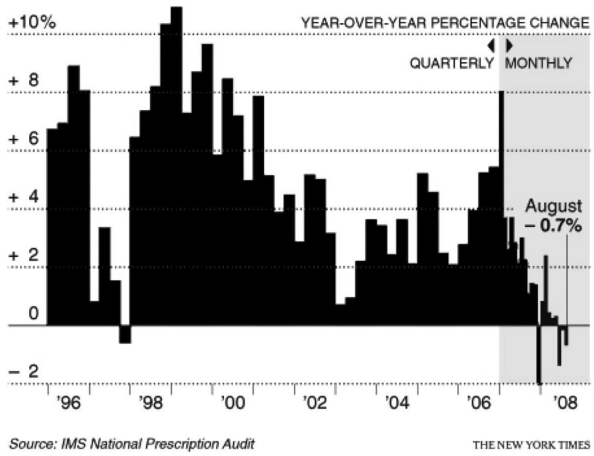

Figure 1

Drug prescriptions dispensed year-to-year.

In a related article, the Kaiser Health Tracking Poll looked at the way patients were consuming healthcare before and after the onset of the financial crisis. They found that in October 2007, as compared with April of 2008, 7% more patients deferred seeking healthcare or skipped needed treatment. Three to four percent more patients either did not fill or finish their prescribed medications. Overall, non-adherence increased from 42% to 47% (fig. 2). When the October group was polled, 20% reported that their condition got worse. In an earlier Kaiser survey conducted in 2006, one in four families reported problems in paying for healthcare. In 2008, that number increased to one in three in 2008.[2]

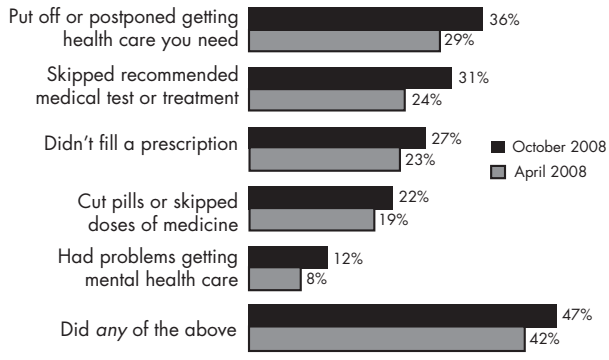

Figure 2

Non-adherence rates: October 2007 v. April 2008

Non-adherence is a worldwide problem. According to the World Health Organization (WHO), 50% of patients with chronic diseases are non-adherent with their medications. For example, in a study conducted in Australia, 57% of patients were non-adherent with any asthma medications, and 72% were non-adherent with prescribed controller medications. Their overall asthma non-adherence rates were estimated at 30-70%, with

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the rates for adolescents as high as 70%.[3]

Not surprisingly, adherence rates in the US are similarly low. In one early asthma study, researchers defined primary non-adherence as the failure to fill prescriptions.[4] They found this rate to be a wide range of 6 - 44%. Secondary non-adherence was defined as the failure to take medications appropriately. To assess this rate, the researchers followed 19 patients for 12 weeks on their prescribed anti-inflammatory steroids. Patients were instructed to record their daily medication use in a journal but were unaware that dose counters were also being used. Overall, they were found to be 53% non-adherent by medication counters even though they over reported their medication use in their journals.

Adherence Reporting

In recent pediatric study, Bender and Rand looked at the different ways of reporting adherence and hypothesized that an impersonal computer reporting method would remove the potential embarrassment. This, in turn they thought, would lead to greater accuracy than face-to-face questioning.[5] Both the patients and their parents were randomized to reporting the patient's asthma anti-inflammatory medication use by computer, pencil questionnaire, or face-to-face interview. Subjects were blinded to the fact that dose counters in each of the delivery devices tracked actual adherence rates. All three reporting groups showed poor correlation between the reported and actual adherence. Moreover, adherence reporting was just as poor for medications taken the day before the data collection began as the week before (fig. 3 and 4).

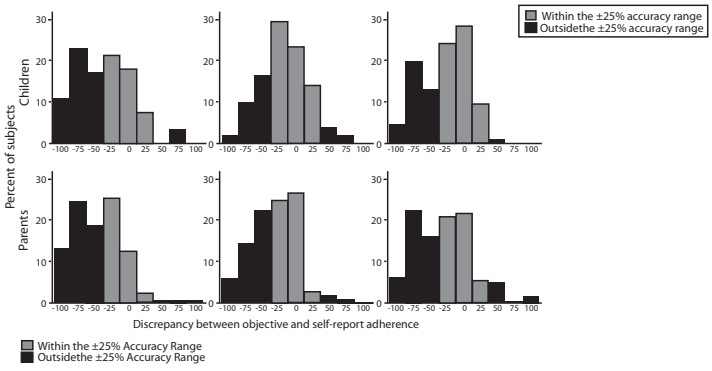

Figure 3

Self-report discrepancy frequencies for past-week questions: ACASI (left), clinical (middle), and questionnaire (right).

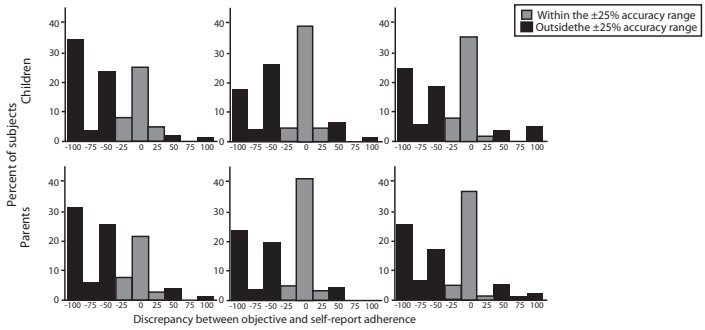

Figure 4

Self-report discrepancy frequencies for yesterday questions: ACASI (left), clinical (middle), and questionnaire (right).

Non-adherence Rates

Patients with COPD adhere to their medications as poorly as any other group studied. Overall, adherence rates for COPD patients are estimated to be around 50%. In a recent study by Bourbeau and Bartlett, when COPD patients were asked why they chose not to take their maintenance treatments, 31% stated it was because they were "feeling good" [6]. However, during exacerbations, COPD patients tended to overuse their rescue medications. A 10-year retrospective study looked at refill rates of inhaled corticosteroids, combination beta agonists and steroids, and anticholinergics in older asthma and COPD patients.[7] The results revealed that medications were underused by 59% of those studied and overused by 12%. Only 28% of prescriptions for repeat inhaled corticosteroids were filled appropriately.

In another example, prescription claims data from Ontario Drug Benefit Program were followed for one year to assess adherence in a population of 31,368 asthma and COPD patients. Refill rates for inhaled beta agonist, anticholinergics and steroids were studied. Tiotropium had the best adherence rate of all the medications and that rate was only 53% (fig.5).[8]

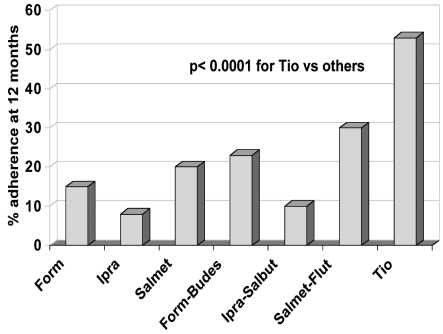

Figure 5

Adherence rates for COPD controller medications

Non-adherence Outcomes

There is no question that non-adherence is associated with poor clinical outcomes. The aforementioned WHO report found that, in patients with moderate to severe asthma and poor adherence, physician visits increase by 5% and hospitalizations increase by 20%.[3]

In a similar vein, Balkrishnan conducted a retrospective 2-year study that looked at prescription refill rates for inhaled corticosteroids in 1,595 patients, aged 65 and older, having a diagnosis of asthma or moderate to severe COPD.[9] Prescription refill rates were used to define degree of adherence. 60% of the group was found to have poor adherence and 10% had good adherence. These two cohorts were then compared on clinical outcomes. Those patients with poor adherence had more hospitalizations, longer length of stay, more doctor visits, less effective use of rescue medications and higher cost of care (table 1).

OUTCOME	POOR ADHERENCE	GOOD ADHERENCE
Hospitalizations per year	0.5	0.3
Physician visits per year	9.0	8.4
Hospital days per year	1.9	1.2
Number of SABA	5.0	5.5
Health care charges	$10,399	$8,412

Table 1
Clinical outcomes from non-adherence.

In a study of elderly patients admitted through an emergency department (ED), 8% of the ED visits were felt to be due to medication non-adherence.[10] Of these, 63% of the non-adherence was determined to be intentional. The major reasons reported included: cost, forgetfulness, adverse effects and switching to unconventional forms of treatment. The authors noted that not all non-adherence necessarily leads to bad outcomes. They define "intelligent non-adherence" as patients altering the dose or frequency of their medications to avoid side effects. Many times, they surmised, this is due to over prescription of the dose or frequency by the clinician. Some patients learn that they can achieve the same therapeutic result with fewer side effects at lower dosages.

In another hospitalization study in the elderly, the percentage of admissions found to be drug related was 28%.[11] Non-adherence accounted for 11.4% of these admissions. For the 36 patients admitted due to non-adherence the total hospital cost was $77,289, approximately $2,100 per patient. Three of the top 9 medications associated with hospitalization due to non-adherence were theophylline, albuterol, and prednisone.

The EFRAM study, from a group in Barcelona, was a prospective case-control study in severe COPD patients looking at risk factor for re-hospitalization.[12] In this group, the average FEV_1 was 39% of predicted. Although medication non-adherence trended with hospital admissions, there was not a significant correlation. However, the findings did suggest that under-prescribing of long-term oxygen therapy, a history of prior admissions and lower FEV_1 values were independently associated with a higher risk of admission for a COPD exacerbation.

Non-adherence and Healthcare Costs

In 2002, the total healthcare expenditures in the US exceeded $1.6 trillion or 14.9% of the gross domestic product (GDP). On a more personal level, this translated to an average of $5,440 in healthcare costs per person. There was an average of 3.1 physician office visits per person, which equates to over 880 million physician office visits a year. With an estimated over 188 million (or more!) medical visits resulting in non-adherence, the waste and excess cost due to non-adherence has been estimated to be as high as $300 billion/year.[13]

From another perspective, when a prescribed course of medication is not completed, this leads to wasted medications. For example, a recent study in a 65-year or older population that employed a medication counter, found that the waste from uncompleted prescriptions accounted for approximately 2.3% of total medication costs, averaging about $30.47 per person.[13] The estimated annual cost for wasted medications - - well over $1 billion per year!

Asthma disease management has been shown to improve clinical outcomes and decrease cost. Total asthma cost is approximately 1- 2% of all healthcare spending. ED and hospital cost are disproportionately higher compared to other care locations. Poor asthma control, with non-adherence as a contributing factor, is a major cost driver. Each preventable ED visit saves a minimum of $500 and each preventable hospitalization saves $2,000 or more. This excess cost for urgent care, ED and hospitalization is nearly $2 billion annually. With optimal control, it is estimated that as much as 45% of total asthma cost could be saved.[3]

The medical care costs for families with asthmatic children ranges from 5.5% to 14.5 % of total family income. When money gets tight, prescription controller medications are frequently the first omitted as a cost saving measure. While the economic reality cannot be denied, in the long run this is a misguided strategy, since not spending the money upfront for controller

medications often results later in increased family and overall costs. And, this is in addition to an increase in the number of lost school days as well as lost work days since a parent often must also remain home with a sick child.[3]

Quality of Life

In an attempt to gauge the impact of non-adherence on the quality of life, researchers provided COPD patients with nebulizers equipped with counters to measure treatment adherence.[14] As in prior studies, the subjects were unaware of the counters. After a 4-week period, the patients completed the St. George's Respiratory Questionnaire. When adherence rates were compared with the quality of life scores from the questionnaire, they found a strong correlation between low adherence rates and lower quality of life scores.

Another study looked at patients who were on long term home nebulizer therapy.[15] Patients with poor adherence scored significantly worse on the family and home life sections on the Recent Life Changes Questionnaire (RLCQ) reflecting greater disruption in home and family life.

Self Management & Adherence Programs

Much can be learned about the impact and cost of non-adherence from the benefits of successful adherence programs. One example is the Harvard Pediatric Asthma Outreach Program that utilizes an asthma case management nurse who spends approximately 8 hours a week to ensure adherence.[16] Over a two-year period, fifty-seven asthmatic patients aged 1 to 15 years were randomized into 2 intervention groups. While both groups received a single intensive asthma education presentation, the outreach group received additional follow-up from the asthma educator throughout the intervention period. Data revealed that ED visits decreased by 73% and hospital admissions decreased by 84% respectively for those in the intervention group. In terms of cost-benefit, it was estimated that for every dollar spent on the case manager nurse's salary, savings to the health plan ranged from $7.69 to $11.67. The key message, again reiterating what has previously discussed, is that non-adherence results in more ED visits, more hospitalizations, and greater overall costs of care.

Another example is the Wee Wheezers program is aimed at children ages 4-6 year olds who are taught to manage asthma attacks and communicate with health providers.[18] The cost is $26 per child. The patients had 0.9 fewer sick days per month, 5.8 more symptom-free days per month, and for the parents, 4.4 more uninterrupted nights sleep per month. The key message in this case is that sustained adherence results in fewer sick days for children and fewer sleepless nights for both children and parents.

Summary

To summarize, non-adherence with prescribed controller medications results in poor clinical outcomes and increased costs. Below is a list summarizing the major impacts of non-adherence that is provided to re-emphasize that there is a clinical and economic imperative to address this major impediment to optimum management of chronic respiratory diseases.

- Poor symptom control
- More frequent exacerbations
- Increased ED visits and hospitalizations
- Unnecessary stepping up of medications and diagnostic testing
- Education interruptions
- Greater family disruption
- Diminished quality of life
- Increased healthcare cost – in the $billions!

Table 2
Major impact of non-adherence

In the words of Brian Haynes, a prolific and highly respected author/researcher on the subject of non-adherence, "increasing the effectiveness of adherence interventions might have a far greater impact on the health of the population than any improvement in specific medical treatments".[18] Thus, promoting improved adherence with properly prescribed controller medications represents a very timely and important challenge for respiratory therapists. Moreover, the potential positive impact of improved disease and symptom control, increased quality of life and reduced healthcare costs would bode well, not only for our patients, but for the healthcare delivery system in general.

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Engaging Patients through a Collaborative Care Model

Kent L Christopher MD RRT FAARC

Introduction

I have been asked to discuss my clinical experience in engaging patients with chronic respiratory disease in collaborative self-care. My views and philisophic approach regarding this aspect of patient care are based upon my past experience as a respiratory therapist working with physicians and as a pulmonary physician working with respiratory therapists. Additionally, it has been requested that I present our experience with an outpatient collaborative care model for patients with chronic respiratory disease. This concept offers a new horizon for respiratory therapists (RTs) to work hand-in-hand with physicians in an outpatient setting to empower patients to actively participate in optimal self-care to control symptoms and to maintain prolonged periods of wellness.

Collaboration: the Clinician-Patient Relationship

A message that is carried throughout this monograph is that we all want better outcomes for our patients, and that this can best be achieved by sustained adherence with prescribed controller medications. Simply handing a patient a prescription for an inhaled medication is not enough. Similarly, initiation of long-term oxygen therapy (LTOT) that is limited to a phone call to the local durable medical equipment (DME) provider is doomed for failure. Even the best writtren protocols, patient care plans, procedures and payor authorization for payment all fall short without the caring hand of the clinician. That said, even the most caring clinicians must adequately address patients' questions, fears and concerns. If we do not meet the needs of our patients, we cannot expect optimal self-care.

The clinician-patient relationship with patients struggling with chronic respiratory disease spans far beyond explaining the peak flow or FEV_1. During a patient encounter, how we use information is oftentimes as important as how much we know. Furthermore, what we do know is inadequate without understanding the needs of each of our patients.

Unfortunately, patient encounters typically have the same set pattern: 1) Clinicians ask very specific questions that are not open ended, 2) Patient responses are typically very limited, 3) Next, an assessment is made, and 4) Recommendations and plans are made or revised as the case may be. Interactive discussion is minimal to none. The patient's needs are not likely to be fulfilled as their questions, fears and concerns were not addressed. In short, collaboration cannot occur without interactive discussion.

In my experience there are two types of clinicians; those who are are "healthcare professionals" and those who are also "caring health professionals". Clinician shortage, ever-increasing workloads and expectations, as well as high levels of stress, tend to distract us from the reason we entered the healthcare profession. The fast pace of clinical practice pushes us to focus more on task completion which may not be balanced with compassionate interactions with our patients.

The checklist in Table 1 presents six questions you may wish to consider following encounters with your patients.

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RT Post Encounter Checklist

- Were you able to "connect" with the patient?
- Did you make appropriate attempts to lift his/her spirits?
- Did you ask open-ended questions and encourage patient questions?
- Were you able to engage in interactive discussion?
- Did you effectively defer to the physician when you could not answer?
- Were you able to use your knowledge and skills in a "teachable moment"?

Table 1

Whether or not you actually "connected" with the a patient is largely intuitive. However, there are some important signals patients often send. First and foremost is the quality of your verbal interaction. Other cues are the patient's affect, attention span and body language and whether or not there was direct eye contact. Patients with chronic respiratory diseases, especially when an exacerbation is experienced, often experience sadness and despair. Everyone needs hope, reassurance and the feeling that someone cares about them. Experienced RTs become adept in balancing their knowledge of the medical condition of the patient with an understanding of the individual's emotional and psychological needs.

It is often relatively straightforward as to when an RT is qualified to give reassurance regarding a patient's medical concern or condition and when one is not. Effectiveness in lifting the patient's spirits frequently has nothing to do with discussion of their medical problems. A few simple gestures such as a warm greeting, and a big smile, as well as inquiries about family and friends can make a huge difference. Spending a few extra minutes sitting in a chair at eye level often brightens our patient's day (and their trust in us) much more than standing over them and giving the impression that you are eager to gallop out of the hospital or exam room or even the home. Asking open-ended questions and encouraging patient questions is paramount to establishing quality interaction and understanding patient needs. As discussed elsewhere in this monograph, Chris M. Garvey FNP MSN MPA, describes the basic skills in asking open-ended questions that will encourage patient questions (and interaction). These skills help foster the attainment of sustained adherence.

Obviously, when a patient question falls outside the boundary of the RT's scope of practice, the proper recourse is to defer to the physician. Sometimes, perhaps even more often than we may realize, this means more than simply telling the patient to discuss the issue with their doctor during their next visit. Depending on the circumstances, it may be appropriate for the RT to directly contact the physician regarding a patient's major issue or concern. Of utmost importance is the fact that every encounter an RT has with a patient brings an opportunity for a "teachable moment". Even though this is clearly not the "high-tech" RTs have been trained for, we now recognize that such "high-touch" is every bit as important. Such interactive "high touch" allows RTs to bring forth their extensive knowledge, skills and experience. This in turn gives patients a better understanding of their chronic respiratory disease, the optimum management plan and the importance of sustained self-care in maximizing health and quality of life.

Collaboration: The RT-Physician Relationship

Over the years I have been amazed by the close professional relationship between the RT and physician communities in general and, in particular, the clinical team partnership between individual RTs and physicians. There are many attending physicians that have a high level of trust and respect for individual RT professionals. Furthermore, there are numerous medical directors that, who in addition to being excellent clinicians, are also strong leaders who actively participate and support their RT departments. Similarly, RT educational institutions count on their medical directors, in addition to program directors and other RT educators, for high educational standards and accreditation. Numerous physicians, in collaboration with RTs, have aggressively supported the expanding volume of research in respiratory care. It goes without saying that there has been staunch physician involvement in AARC annual meetings, various RT programs and medical publications, including the scientific journal Respiratory Care. There is also direct physician support of the profession through the AARC Board of Medical Advisors (BOMA), the National Board for Respiratory Care (NBRC) and the Commission on Accreditation for Respiratory Care (CoARC). Finally, there are numerous physician organizations that support the RT profession, particularly with regards to legislative and regulatory issues.

Table 2 lists questions you may wish to ask regarding

Collaboration Regarding Self-Care: Your Physician-RT Relationship

- Is care collaborative with interactive discussion between professionals?
- Do you have a "team approach" or are you "islands"?
- Do physicians allow you to participate in patient self-care education?
- Is there an RT-physician "game plan" regarding self-care education?
- Is there organized and objective feedback to know if your plan is working?
- Is your collaborative self-care education updated with new scientific information?

Table 2

your physician-RT relationship.

Unfortunately, many RTs may not have the luxury of a collaborative and interactive professional relationship with their medical director or even attending physicians. You may be on the receiving end of written orders with little opportunity for your valuable input. It is understandably an uncomfortable position being an oarsman with no ability to change the course of the ship. Though this issue is of paramount concern to the RT profession, it is beyond the scope of this monograph to address this problem. On the bright side however, many of those physicians still rely upon RTs to administer self-care education in the use of prescribed inhaled medications. This expectation also spills over to respiratory equipment such as continuous positive airway pressure devices (CPAP), mechanical ventilators (invasive as well as non-invasive) or LTOT. Take every opportunity to make a significant impact upon that individual's health and quality-of-life.

Now, if the prescribing physician is supportive of your participation in self-care education, you might ask yourself - do you in turn have your own game plan to close the loop? Are you effectively communicating important and relevant information back to the physician? If not, implementation of an organized and effective feedback system is essential, not only to determine whether or not your actions and outcomes are efficacious, but if these actions and outcomes are consistent with what the physician intended. Such evaluation and analysis in needed to assure success both collectively in your patient population and on a case-by-case basis. As with any medical intervention, the care we provide needs to be periodically reassessed based upon insight from new scientific information.

The RT in Outpatient Pulmonary Medicine: A Collaborative Self-Care Model

The incidence, prevalence and healthcare costs in the US directly (and indirectly) associated with chronic respiratory diseases such as COPD, asthma and obstructive sleep apnea are overwhelming. In fact, they are overwhelming the healthcare system. Although hospital care has made significant strides in technology and pharmacologic interventions, it is still limping along as an inefficient delivery system. Sadly, high hospital utilization is often a result of inadequate outpatient care, especially with regards to individuals with the chronic respiratory diseases noted previously. The recurrent need for frequent re-hospitalization is analogous to closing the barn door after the horse has left.

The premise of this monograph is that collaboration among and between RTs, physicians and chronic respiratory disease patients can result in improved self-care, particularly with respect to sustained adherence. Make no mistake - RTs have made significant contributions in both the acute care and home respiratory care settings. However, it is unfortunate that reimbursement constraints continue to make utilization of the RT in the home (through DME providers) more and more prohibitive. Absent any drastic reductions in Medicare coverage for the RT in the home setting, RT services would be anticipated to improve the quality of home healthcare delivery. However, if the healthcare system is to work for the benefit of the expansive growing population of millions of patients with chronic respiratory disease, the vast majority of care will need to be delivered through the outpatient clinic or medical office setting. The outpatient environment has the greatest potential for effectively and efficiently becoming the catalyst for self-care with sustained adherence. There is obviously a role for the RT in this setting, yet outpatient care is greatly underutilized with regards to onsite RT clinical expertise. When the famous outlaw Willie Sutton was asked why he robbed banks, he replied "because that's where the money is." Perhaps it is time for an accelerated entry of RTs into the outpatient arena, since that is where most healthcare policy makers tell us the majority of future patients will be.

The passage of the Medicare Improvements for Patients and Providers Act of 2008 (MIPPA), represents a major opportunity in that regard. One component of the MIPPA legislation mandates that the Centers for Medicare and Medicaid Services (CMS) promulgate, no later than January 1, 2010, a standardized national Medicare eligibility and coverage policy for pulmonary rehabilitation. At present such eligibility and coverage determinations are made at the local level by contracted Medicare fiscal intermediaries, and astonishingly, many such contractors do not cover this important and evidence-based intervention, arguing that the evidence does not support its effectiveness. However, beginning in 2010, RT Departments nationwide will finally be able to offer their chronic respiratory patients access to a proven and cost-effective intervention, that intervention that RTs themselves will be able to provide under a national reimbursement structure in an outpatient setting.

In light of the fact that for years Medicare coverage for pulmonary rehabilitation has been anything but robust, and frustrated that many of my patients were not getting the extended care they needed to prevent an exacerbation leading to hospitalization, I decided to take matters into my own hands. Nearly 19 years ago, I approached Stephanie Diehl, a practicing RRT in the Denver area, to see if she would be interested in the

creation of a novel physician-RT collaborative outpatient pulmonary medicine model. In addition to the potential for improved care for my chronic respiratory disease patients, Stephanie readily appreciated the advantages that this new environment presented RTs who were exploring alternatives to critical care within acute care hospitals. Over the years, the advantages of our novel professional relationship have expanded well beyond our initial plans and are listed in Table 3.

Outpatient Pulmonary Medicine Environment: Advantages for the RT

- Dayshift with weekends and holidays off
- Alternative to the critical care environment and related high intensity and stress
- Opportunity for a new frontier and professional growth
- Opportunity to play a significant team role
- Active participation in continuity of care
- Education and monitoring of patient self-care with fostering of sustained adherence
- Satisfaction of long-term professional relationships with patients

Table 3

While the onsite utilization of RTs in the outpatient environment is certainly not yet as commonplace as it should be, it is no longer considered a totally novel or unique concept. The roles and responsibilities of the RT vary among outpatient settings across the spectrum - from the university clinic to both large and small private practice groups. Participation of RTs will be influenced by the involvement of other clinical staff, such as RNs and LPNs, nurse practitioners and even medical technologists. Duties may often be driven by the technical services offered in a particular outpatient environment (e.g. pulmonary function testing, exercise testing, and endoscopy). However, the scope of non-technical, direct patient care responsibilities will likely be a function of the individual RT-physician professional relationship.

Stephanie and I believe that the model that we have refined over the years has proven very effective and professionally gratifying. The following discussion is a summary of her roles and responsibilities that evolved in the management of chronic respiratory disease patients in our particular outpatient medical office setting.

There are certain procedural skills that one would expect the RT to bring to the outpatient environment. Even though the procedures could be delivered through a separate hospital facility, delivery onsite in the office or clinic can be scheduled quickly and done more efficiently with rapid turnaround of results. Again, those tasks will depend upon the scope of the outpatient services. Examples of our substantial experience with RT procedures performed in the medical office are identified in Table 4.

Outpatient Role of the RT in Procedures

- Clinical testing
  - Spirometry pre and post bronchodilator
  - Rest and exercise pulse oximetry (including O_2 titration)
  - Arterial blood gas draw
- Medical procedures
  - Assist in transtracheal catheter insertion
  - Perform transtracheal catheter cleaning (removal over wire guide)
  - Assist in fiberoptic rhinolaryngoscopy
- Technical care
  - Nebulized bronchodilator administration
  - Assessment of appropriate stationary & portable O_2 delivery system
  - Patient evaluation on intermittent flow O_2 delivery devices

Table 4

With Stephanie's full-time presence in the office practice, she is able to lend her clinical insight to coordination of a number of care tasks. Consequently, we no longer had a need for a medical technologist and there were reduced time demands placed upon receptionist personnel. These savings in operating costs were easily shifted to support part of the salary of the RT. Table 5 shows the important tasks performed by the RT that facilitated coordination of care and kept the ball from being dropped.

Outpatient Role of the RT in Care Coordination

- Schedule outside testing
- Obtain outside test results
- Schedule return visits
- Facilitate referrals
- Obtain referral reports and hospital records
- Document coordination with primary care
- Facilitate completion of Certificates of Medical Necessity for LTOT

Table 5

A theme that threads throughout this monograph is that patient education is key to their "buy in" for sustained adherence. This outpatient care model has demonstrated that RTs can play a critical role in supporting the physician in patient education, especially

with regards to the patient's and their understanding of how any why benefits can accrue from self management. Table 6 list the educational contributions in our model.

In this outpatient care model, the role of the RT was expanded to involve a greater participation in patient evaluation and management as a result of demonstrated expertise. This experience (shown in Table 7) fostered RT professional growth with utilization of expanding knowledge to engage in higher levels of assessment and decision making.

Outpatient Role of the RT in Patient Education
• Understanding chronic respiratory diseases
– Asthma
– COPD
– Interstitial lung disease
– Other pulmonary diseases
– Obstructive sleep apnea
• Importance of test results and follow-up studies
– Spirometry, oximetry, sleep studies
• Benefits of sustained adherence with medications
• Proper technique with inhaled medications
• Benefits of other devices (CPAP, home ventilation, LTOT, TTO)
• Proper use and sustained adherence regarding other devices (CPAP, home ventilation, LTOT, TTO)
• Reinforcement of the self-care plan

Table 6

Outpatient Role of the RT in Patient Evaluation and Management
• Check patients into the examination room
• Obtain interim history
• Perform preliminary HEENT-chest examination
• Update medication & treatment flow sheet
• Assist in self-care plan design & revision
• Facilitate prescription writing
• Dispense samples
• Triage patient phone calls

Table 7

The RT roles and responsibilities illustrated in Tables 6 and 7 also obviated the need for a nurse in this particular office practice setting. Again, control of operating costs allowed funds to be available to offset RT salary. As noted in Table 8, it became clear through implementation of this model that collaboration of the physician with the RT resulted in numerous physician benefits as well.

Though there were benefits to the physician and RT, the true goal of this model was to facilitate improved patient health and quality of life through a collaborative experience with the caregivers. It is our conclusion that the patient benefits noted in Table 9 can promote sustained adherence.

RT in Outpatient Care: Physician Benefits
• Improved patient education and care
• Trusted interface between patient & physician
• Reliable triage clinician in office while physician in hospital setting
• Reduced workload burden with improved efficiency
• Opportunity for innovation
• Opportunity for clinical research
• Opportunity for intellectual growth

Table 8

The Collaborative Experience: Patient Benefits
• Feeling of Trust
• Compassionate care
• Appropriate reassurance
• Access to care
• Coordinated care
• High quality education
• Management through integrated knowledge
• Reliable self-care plan

Table 9

Summary

There is definitely a role for the RT in the outpatient management of patients with chronic respiratory disease, although this aspect of professional practice is not yet widely in place. This outpatient model suggests that self-care is best served by an RT-physician team relationship that is both collaborative and patient-centric. A major obstacle to overcome is the lack of a reimbursement structure for outpatient services delivered by an RT working under the supervision of a physician, (or, in Medicare lingo "incident to the physician"). The AARC is presently pursuing legislation that would allow billing of RT services under physician oversight, similar to that of a physician assistant. Strong support of this pursuit by the RT and physician communities could will help lay the groundwork for exciting new career opportunities that promote the health and quality of life for our growing population of patients with chronic respiratory disease.

Additional Reading

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Promoting Sustained Adherence: Tricks of the Trade

Christine M Garvey FNP MSN MPA FAACVPR

Introduction

Optimizing sustained adherence to medications translates effective clinical skills into meaningful outcomes for patients with chronic lung disease. Important components include: evaluating adherence and related barriers, providing effective patient-centered strategies such as motivational interviewing and use of optimal delivery devices that are appropriate for the patient's age, physical capacity and cognitive function.

Methods for evaluating adherence include self-report, patient interview, dose counting and electronic monitors. Self-report and patient interview are simple and inexpensive but may lack accuracy. Dose counting and use of electronic monitor devices attached to the inhaler improve accuracy but are costly and cumbersome. Informing the patient that medication use will be monitored may enhance adherence to treatment.

Perceptual barriers such as concerns about medications and their effects may impact adherence. Concerns about medications may include: lack of information, harmfulness, dependence, long term effects and belief of diminished effectiveness when used regularly.

Up to forty-five percent of inhaled corticosteroid (ICS) users report ten or more moderate to severe side effects related to the medication and concerns are most strongly related to higher doses of ICS.[1]

Using a framework for medications that 'makes sense' to the patient is important to promote treatment acceptance and ongoing use. Health threats such as lung disease may trigger development of a 'mental map' based on a patient's understanding and beliefs about the disorder and symptom experience that guide a patient's actions. A patient may process clinical advice in light of their personal understanding and beliefs about the illness which may conflict with medical practice and recommendations.[2] When a patient is symptom free, he or she may believe their lung disease is controlled and long term medications are not needed. A rationale for daily maintenance medication should not at odds with the patient's understanding of the disease and its management. Adherence improves when a patient has a 'medical view' of the lung disorder. Clinicians should help patients to view disorders such as asthma or COPD as chronic diseases with acute features and be knowledgeable about why treatment should reflect this. A key message is that persistence is necessary even when respiratory symptoms are not present. [2]

Factors that influence adherence include: the patient's acceptance of the disease process and recommended treatment, understanding and faith in the treatment, effective patient - clinician interaction and incorporating the medication into their daily routine.[3] Other factors that improve adherence include: a clinician's willingness to listen, spend time with the patient, be supportive and empathetic and a patient's trust in their clinician.[4] Greater perceived disease severity and longer disease duration have also been associated with improved adherence as have greater MDI instruction, fewer medications, fewer doses and / or inhalations.[5,6,7] Factors that negatively impact adherence include: language barriers, suboptimal selection of delivery device, medication cost, side effects, complex medication regimens and psychosocial co-morbidities including depression.[4,5]

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Patients may not understand that certain symptoms suggest poorly controlled lung disease such as activity limitation, interrupted sleep or intermittent exacerbations and that these findings point to the need for ongoing medication. Patient education includes relevant information about the patient's lung disorder, medications, reassurance about side effects and the need for daily use in the absence of symptoms. The medication schedule should be tailored to patient's lifestyle. A nonjudgmental manner is important to elicit and address concerns about medication use and perceived side effects. Practical support includes ongoing training and return demonstration of proper inhaler technique and evaluation for side effects such as oral candidiasis and / or dysphonia. A treatment change or an alternative profile may be needed for unresolved or intolerable side effects.[2] A written action plan should be collaboratively developed and regularly updated that includes medication schedule in the patient's preferred language. Medication labels should also be in the patient's preferred language and / or use pictograms. Suboptimal adherence or faulty inhaler technique should be suspected following an exacerbation or flare. Educational support and monitoring of adherence can be supported with referral to Asthma clinic or camp, Better Breathers club or Pulmonary Rehabilitation program.

Inhaled medications have several advantages over oral medications, including greater concentration and effectiveness with fewer side effects. Use of combination inhalers may improve adherence and reduce asthma severity.[8] Suboptimal control has been found to improve with the addition of long acting beta agonists or LABAs to ICS as well as improvement in lung function, quality of life and exacerbations compared to concurrent inhalers.[3,9] Use of a combination inhaler also simplifies the regimen and may lower medication costs or co-pays.

Collaborative patient self management is associated with improved adherence and fewer ER visits.[10,11] Key features include identification of barriers to adherence, ongoing self-monitoring of medications, goal setting and problem solving.[12] Patient-centered approaches recognize that patient motivation is necessary for acceptance and adherence to treatment. 'Motivational Interviewing' focuses on two key strategies: building the patient's built-in motivation to use recommendations and resolving ambivalence toward the change in behavior.[12] Important areas of focus include relating change to the patient's values and goals, e.g., the use of controller medication may improve participation in sports, quality of sleep at night, etc. Begin by setting an agenda and offering a menu of options to increase patient participation in decision-making. Explore the patients concerns and beliefs about the options. Encourage active involvement and elicit shared goals. Ask the patient to describe a typical day and where medications fit in to assess adherence in a nonjudgmental framework. Use 'I' statements to support patient autonomy and empathy and evocative questions to elicit positive statements about change in a comfortable, non-coercive atmosphere. Open-ended questions offer a framework for the patient to 'tell their story' about beliefs and concerns. Affirmations or statements of appreciation support positive patient statements and actions. Reflective listening helps the patient to hear the clinician's interpretation of the discussion.

Finally, summary statements pull together the discussion. Emphasize that the risk for uncontrolled respiratory disorders is greater than the side effects of medications. Consider the following dialogue: '*As your respiratory therapist, I believe that the most important thing for your asthma is to use your controller inhaler daily. The decision is up to you. I know these decisions can be difficult. What would make this work for you?*

Age-appropriate interventions should be considered when working with teens and children. Maximize effective communication and self-esteem by meeting with teens without parents present. Involve parents at end of the meeting to review the discussion and discuss ways parents can support the teen's efforts. Involve teens in setting goals and development of an action plan, keeping the plan simple. Consider use of a "contract" of expectations, benefits and consequences. Stress that controller medications can be taken before school and that daily use will mean fewer flares and less need for rescue inhaler. Teens often relate to idols such as celebrities and athletes. Remind the patient that many elite Olympic and professional athletes have asthma. Consider referral to an asthma support group to facilitate support through peer interaction.

Advise parents that use of ICS prevents asthma symptoms and has no role as a rescue medication. Promote a child's acceptance of medication use by making the process enjoyable with a game, toys, reading, singing, DVD or video. Reinforce use by rewarding children with a book, healthy treat or stickers. Encourage the parent to keep treatment times consistent. Children ten years or older should be directly involved in setting goals, development of the action plan and the review process. Encourage the child to take the action plan to school and camp. Resources include http://www.peakperformanceusa.info/ and http://www.asthma.org.uk/using_your.html

Cultural barriers may lead to distrust of the healthcare system and doubts about usefulness of anti-inflammatory medications. Address the diverse needs of patients with culturally competent care to improve outcomes and patient satisfaction. When language, literacy or learning barriers are suspected, ask the patient to repeat or restate medication instructions and offer help if the patient has trouble reading. Use caution not to overwhelm the patient with information at each visit and schedule regular follow-up visits to reinforce education. Resources for diverse learning levels include the American Medical Association health literacy information and toolkits at www.ama-assn.org/ama/pub/category/8115.html

Unintentional non-adherence can be due to incorrect device use including failure to prime MDIs and improper doses tracking. One study found that seventy-two percent of MDI users continued to use the MDI until the inhaler made no sound when actuated.[14] Various devices may promote regular medication use and dose tracking. Inhaler dose counters include the Doser (800.863.9633 or www.doser.com) and the MD Turbo (www.mdturbo.com) . Various valved holding chamber options are available including the LiteAire dual-valve collapsible spacer (800.250.3330 or www.thayermedical.com). Portable spacer and nebulizer options include the MicroChamber and MicroSpacer (978.97.1947 www.rdusa.com) and AeronebGo Micropump Nebulizer (www.aerogen.com).

Selection of the optimal delivery device requires consideration of age, ability to use device correctly, convenience, dose frequency, cost, insurance coverage and patient preference. A small volume nebulizer (SVN) is appropriate for all ages and inhalation velocities. Coordination is not required and doses can be adjusted. Combining nebulized medications may be an option but requires assurance of drug compatibility.

An MDI is complex device which presents challenges for proper use including coordinating deep inhalation with actuation. HFA formulations need to be primed before use and if not used for seven or more days or if dropped. Use of a spacer/valve holding chamber simplifies MDI technique, prevention of deposition of larger particles in the oropharnyx and allow for prolonged inhalation. There is limited data on use of HFA MDIs with holding chambers. Use of an electrostatic resistant holding chamber (www.mongahnmed.com) or pre-washing with liquid detergent and thorough air drying is recommended.

Inspiratory flow drives activation of dry powder inhalers to carry medication to the lungs. Devices are not dependent on propellants and minimal coordination is needed. Limitations include difference across the spectrum of device designs and poor efficacy for patients with severe impairment in inhalation velocity. Regular clinical evaluation and follow-up should be used to promote ongoing education and adherence.

Some products may offer advantages such as *ciclesonide* (www.alvesco.com), a new inhlaed corticosteroid that is classified as a pro-drug that is activated in the lungs and not in the oral cavity. It is associated with less than 1% of dysphonia and oral candidiasis as well as 52% pulmonary deposition when used without a holding chamber.[13] Various manufacturers have websites that support adherence including:

- Symbicort – www.mysymbicort.com - Includes reminders for medication, refills, physician appointments and monthly savings coupons.
- AstraZeneca – www.everydaykidz.com - Asthma kid program offers a quarterly brochure and supplies.

Medication costs vary as do coverage by insurance companies. Most pharmaceutical companies have plans for low cost medications for persons meeting low income levels. Various controller inhaler options and approximate costs are listed in table 1.

MEDICATION	COST *Smallest approved dose, 30 day supply*
Advair *(fluticasone / salmeterol)*	Discus: $167.82, HFA: $1673.44
AeroBid *(flunisolide)*	$87.86
Alvesco *(ciclesonide)*	$148.20
Asmanex (*mometasone)*	$109.10
Azmacort *(triamcinalone)*	$145.02
Brovana *(arformoterol solution)*	$341.46
Flovent *(fluticasone)*	Discus: $90.98, HFA: $95.60
Foradil Aerolizer *(formoterol)*	$148.07
Pulmicort *(budesonide)*	Flexihaler: $136.62, Respules: $216.34
Serevent *(salmeterol)*	$146.15
Spiriva *(tiotropium)*	$171.97
Symbicort *(budesonide/ formoterol)*	$120.66
QVAR *(beclomethasone)*	$71.58

Prices from http//www.rxusa.com

The clinician plays a critical role in optimizing medication adherence through focus on clinician – patient communication and advice regarding long term use and rationale. Effective treatment requires combination of

medication and behavioral approaches beginning with assessing patient understanding of medication schedule and use, ongoing education and follow-up, review of device technique and a written medication schedule and information. Effective clinician-patient communication is a key feature in promoting a patient's motivation to use medications. Interventions should address age, cultural and learning needs. Uses of respiratory care protocols offer a collaboratively developed structure to support effective clinical care, patient education and optimal outcomes.

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Why Patients Stop Taking Their Controller Medications

Patrick J Dunne MEd RRT FAARC

Objectives:

- Describe why the word *adherence* is preferred over *compliance*
- List four reasons why patients stop taking prescribed controller medications
- State the importance of sustained adherence in controlling symptoms
- Describe why respiratory therapists should promote sustained adherence

Questions:

1. In the context of taking prescribed controlled medications, the word *adherence* implies:

   A. A patient who merely follows the doctor's orders
   B. An activated patient who willingly accepts responsibility
   C. A patient who reluctantly give into a demand
   D. None of the above

2. Non-adherence with prescribed controller medications contributes to:

   A. Sustained symptom control
   B. Increased morbidity and mortality
   C. Increased health care costs
   D. B & C only

3. The most important controller medication for asthma is:

   A. Twice weekly short-acting beta agonist
   B. Low-to-moderate doses of inhaled corticosteroid
   C. Twice daily long-acting beta agonist
   D. Once daily anti-cholinergic

4. Which of the following would contribute to non-adherence?

   A. Concerns over adverse events
   B. Concerns over the expense of medications
   C. Medications are thought to no longer work
   D. All of the above

The Impact of Non-Adherence With Respiratory Controller Medications

Russell A Acevedo MD FAARC

Objectives:

- Describe the economic impact of non-adherence with respiratory controller medications
- List three positive outcomes associated with sustained adherence with prescribed respiratory controller medications
- Discuss why self-report of medication administration alone is not always effective in determining sustained adherence
- Describe ways that non-adherence can lead to symptom flare-ups

Questions:

1. Which of the following is an effective way for patients to report adherence?

    A. Electronic reporting
    B. Pencil/paper daily logs
    C. Weekly face-to-face interviews
    D. None of the above

2. In the study by Balkrisnan evaluating prescription refill rates for inhaled corticosteroids, which of the following is true?

    A. Poor adherence resulted in fewer hospitalizations
    B. Good adherence resulted in fewer doctor visits
    C. Good adherence resulted in greater use of short-acting beta agonists
    D. Poor adherence resulted in lower health care costs

3. Which of the following statements is true regarding improved adherence with prescribed nebulizer treatments in COPD patients?

    A. Higher adherence resulted in lower medication use
    B. Lower adherence resulted in higher medication use
    C. Lower adherence resulted in lower quality of life
    D. Higher adherence resulted in higher quality of life

4. Non-adherence can also contribute to:

    A. Reduced frequency of symptom flare-ups
    B. Increased periods of wellness
    C. Decreased costs for medications
    D. Increase in wasted medications

Engaging Patients Through a Collaborative Care Model

Kent L Christopher MD RRT FAARC

Objectives:

- Describe the best type of questions to ask when conducting a patient interview
- State how a respiratory therapist should evaluate the success of a patient encounter
- Discuss the essential components of a successful collaborative self care model
- Describe the potential impact of the Medicare Improvements for Providers and Patients Act of 2008 for COPD patients

Questions:

1. For optimum clinician-patient interviews, which of the following is a true statement?

   A. It is best to have a patient complete a written questionnaire
   B. It is best to ask open-ended questions
   C. It is best to try and keep patient responses to a few words
   D. It is best to only ask specific questions

2. To determine if a patient encounter was successful, which of the following should a respiratory therapist consider?

   A. Was the encounter/discussion interactive?
   B. Did the patient feel engaged?
   C. Were teachable moments fully utilized?
   D. All of the above

3. In order to be successful, a collaborative self-care model for a chronic respiratory disease state management program would be:

   A. Physician-therapist
   B. Therapist-patient
   C. Physician-patient
   D. Physician-therapist-patient

4. The Medicare Improvements for Providers and Patients Act of 2008 mandates the Centers for Medicare and Medicaid Services to:

   A. Increase the payment rate for long-term oxygen therapy
   B. Authorize reimbursement for RRTs for home care services
   C. Establish a national coverage Medicare policy for pulmonary rehabilitation
   D. None of the above

Promoting Sustained Adherence: Tricks of the Trade

Chris M Garvey FNP MSN MPA FAACVPR

Objectives:

- List three factors that improve patient adherence with prescribed controller medications
- Describe the essential elements of motivational interviewing
- Identify common barriers to adherence related to inhalers
- Discuss why age-appropriate interventions improve adherence

Questions:

1. Which of the following is an important factor in having a patient remain adherent with prescribed mediations?

   A. The intensity of the physician's advice
   B. The reputation of the physician in the community
   C. The instruction provided by the pharmacist
   D. The degree to which the patient accepts their disease process and recommended treatment

2. Motivational interviewing is intended to:

   A. Focus on the consequences of untreated disease symptoms
   B. Keep patients engaged by having them track when they take the medications
   C. Help patients resolve their ambivalence toward their disease
   D. Get patient's family members to provide oversight on adherence

3. Inhalers are preferred devices for improving adherence because

   A. They are more convenient to use than nebulizers
   B. They are usually covered by insurance
   C. They deliver more aerosol drug than a nebulizer
   D. They last longer than a nebulizer

4. Age-appropriate interventions improve adherence because

   A. Older patients do not require as much time to learn about their disease
   B. Older patients prefer interacting with older clinicians
   C. Children and teens tend to respond better when instruction is provided without their parents in attendance
   D. Children are more inclined to do what their parents tell them to do

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