

## A Perspective on Inhalers

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I went to the pharmacy to pick up an albuterol inhaler and found my co-pay was \$85. Not only that, but it was a cheap generic that did not have a counter on it, which does not meet the current guidance's of the FDA for inhalers, but was on the market before they began cracking down. Out of curiosity, I asked the pharmacist what they charge for an inhaler with albuterol and ipratropium (previously known as CombiVent®), to be informed that it was now supplied in a soft mist liquid inhaler (Respimat®) retailing for over \$260.

I recall the days (20 years ago) when the hospital cost of an albuterol pMDI was \$6, and both albuterol and CombiVent were available retail for \$40 or less (with typical copays of \$5 for an insured patient). The pharmaceutical industry blames the increased cost of inhaler on the government requirements to replace chloroflourocarbons (CFC), a greenhouse gas, with the current hydroflouroalkaline (HFA) as the propellant in the pMDI. A consortium of 8 companies spent 8 years developing HFA, with the first substantial redesign of the pMDI since the 1950s, and then spent millions of dollars lobbying congress that they should be able to charge >6 fold more for their new inhaler design with the same old drugs. Welcome to the wonderful world of drugs in America.

I am not writing to whine about runaway costs in the US, but to make the point that inhalers are not simple and they are not cheap. The albuterol/ipratropium liquid formulation for nebulizers costs around 25 cents a dose or less than \$30/month, and delivers more drug to the lungs of the patient than the pMDI (which might be why so many COPD patients claim they prefer a nebulizer when they are short of breath). However, nebulizers can be expensive and require daily maintenance and cleaning, and may be less convenient.

There are a lot of different inhalers on the market, with more being added every year. Many of them seem to be "me too" combinations with little data showing more than noninferiority to their comparators, and very few of them are less expensive. However, each one of them tends to have their own design and operating instructions. And for each on of these inhalers, if you do not use it properly, you do not get benefit of the medication. It has been well established that up to 60% of patients do not use their inhaler sufficiently to benefit from the medication. That is outrageous.

These same patients likely have a smartphone, which come with no or minimal instruction manuals. If 60% of a phone's owners could not make a phone call, they would not use that brand of phone. But unlike a phone, users of inhalers are seldom aware that they are not using their inhaler properly.

## **Effective inhaler therapy is 10% medication and 90% education.**

I would ask you to take a moment and think back to how you learned about inhalers and how to use them.

If you were a medical student in the US, 90% of training textbooks for medicine provide no instruction on how to use a “simple” inhaler. Nurses and respiratory therapists get more, but still not sufficient to encompass all of the new devices coming on to the market. It has been estimated that it takes about 8 years for clinicians to learn how to use a new inhaler after it is introduced. So it is not surprising that up to 60% of prescribing clinicians do not operate the inhalers properly.

Unlike the cell phones, inhalers all come with package inserts which describe how to use the inhaler. Unfortunately, these are typically in small print, and written “by lawyers for lawyers”. And it really helps if you can read English at a high school level, which unfortunately up to 70% of the US population can not. For years, researchers noted errors with pMDIs, suggesting that DPI were less error prone. However more recent reports suggest that all inhalers are prone to error.

The phone will work whether you dial fast or slow, however inhalers require their own specific range of inspiratory flow to emit drug efficiently.

pMDI are best with slow deep inspiration while dry powder inhalers often require inspiratory flows up to 60 – 90 L/min.

There is a reason that some DPI with individual capsules containing powder warn patients not to swallow the capsule. The capsule or packet containing powder has to be pierced or open before use.

Exhaling into the DPI prior to inhalation can blow the drug away from the patient.

Actuation of metered dose inhalers and soft mist inhalers need to be coordinated with inspiration, or the patient can blow the aerosol away.

Some DPIs must be held in an upright position or the powder falls out of the pathway to the patient.

These are just a few of the common errors reported.

It is not surprising that a patient with different devices may become confused as to how to breathe in and operate each device. This has been lovingly termed “device dementia”.

So billions of dollars are paid for inhalers and 60% of it is wasted. Worse yet, the patients do not benefit from the prescribed drug, so they keep coming back with the same complaints, all too often resulting in unplanned emergency room or clinic visits, prescribing progressively higher doses, higher frequencies or even more expensive (more powerful) drugs.

All this can be avoided if the prescribing clinician:

1. Assures that “someone” who knows how to use the inhaler “teaches” the patient. This is best done with placebo devices (provided by the manufacturer) used for demonstration and return demonstration. Also, provide supplementary instructions with good pictures or diagrams and clear verbal instructions written at a 3<sup>rd</sup> grade level, in a language the patient speaks (or reads).
2. instructs the patient to bring in their inhalers to office visits periodically and observe how they are using each inhaler, and provide additional instruction to improve their technique.

There are a number of strategies for doing this, some of which can be relatively inexpensive, but you cannot assume that someone else is doing it for your patient. You need to assure that it gets done if you don't want your patient coming back with complaints of unabated symptoms after they have tried to follow your care plans.

Resources:

<https://www.aarc.org/education/online-courses/aerosol-devices/>

[http://www.yourlunghealth.org/healthy\\_living/aerosol/Patient\\_aerosol\\_guide.pdf](http://www.yourlunghealth.org/healthy_living/aerosol/Patient_aerosol_guide.pdf)

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