The risk/benefit proposition for medicated aerosol therapy rarely considers the risk side of the equation for the patient receiving the therapy or the attendant risk to caregivers and/or family members who provide it.

Protect the Patient; Protect the Caregiver

For all of its benefits to patients, aerosol therapy carries with it certain risks:

(1) *de novo* pulmonary infection,
(2) worsening of existing pulmonary infection,
(3) prolongation of existing infection, or
(4) interference with the effectiveness of prescribed antibiotics.

Caregivers, including family members, who are in close proximity to patients receiving aerosol therapy in either the hospital or the home, are also at risk due to:

(1) inhalation of exhaled patient droplets that may contain pathogens, leading to or causing a new upper or lower respiratory infection, and/or
(2) inhalation of prescription medications that have not been prescribed for them and are not indicated for them.

The consequences of inhaling certain medications that are neither prescribed nor indicated can be quite serious. The chief issue for caregivers, especially respiratory therapists, is the chronic, low-dose exposure to beta-agonist medications (albuterol). There are numerous reports in the medical literature of caregivers with no prior history of asthma developing asthma after working with beta-agonist aerosol administration for a period of time. Other reports in the literature suggest that chronic exposure to beta-agonists may “downregulate” beta receptors, thereby causing increased bronchomotor tone and increased susceptibility to various asthma triggers.

*To protect the patient, the Circulaire II also protects the nebulizer.*

With practically all other aerosol delivery systems, the nebulizer has no protection against becoming contaminated by the patient’s saliva (mouthpiece drool), or by airborne patient droplets that may have been coughed retrograde back into the nebulizer itself. If this happens, any organisms present in the saliva, sputum or patient droplets may deposit in the nebulizer and possibly proliferate, only to be re-nebulized back into the patient’s lungs during the same treatment or a subsequent treatment.

Only the Circulaire II and Circulaire II *Hybrid* contain a one-way flapper valve that is designed to *protect the nebulizer* and prevent it from becoming contaminated by the patient while in use. And, while protecting the nebulizer from contamination, the reservoir bag or reservoir ball that doubles the delivery rate of medication (compared to other devices) is also protected from contamination.
Protect the Nebulizer

A recent clinical microbiology study by Grzeskowiak and Mc Kee, of Long Beach Memorial Medical Center & Miller Children’s Hospital in Long Beach, CA has found no growth in 252 cultures taken from Circulaire II nebulizers and reservoir bags and balls in patients receiving aerosol therapy up to 4 consecutive days. The authors state that the findings suggest that the design of the device (flapper valve) may isolate the nebulizer and reservoir to protect them from contamination.

This study has been submitted to the American Association for Respiratory Care to be presented at the AARC Open Forum in November 2013.

Protect the Caregiver

While not a complete solution, use of the Circulaire II high-efficiency aerosol drug delivery system will mitigate exposure to exhaled patient droplets and medication aerosols during aerosol therapy. The Circulaire II and Circulaire II Hybrid are the only aerosol delivery systems on the market that automatically include an integral exhalation filter with every system. With all other aerosol delivery devices, exhalation filters are either an optional accessory or not available.

Isn't it about time?

• CRNAs and anesthesiologists have been protected for years from breathing trace anesthetics gases and vapors by scavenging systems.
• Central Sterile Supply technologists have been protected for years from breathing ethylene oxide gas sterilant vapors.
• Hospital pharmacists have been protected for years from exposure to dangerous chemotherapy agents that they mix and prepare.

Isn't it about time that respiratory therapists are protected from the occupational hazards that accompany their jobs: namely exposure to exhaled patient droplets and fugitive medication aerosols?
References


5. Demers B. Drugs prescribed for patients shouldn’t be taken by caregivers! Chest 2004; 126:1012-1013.


Michael McPeck, RRT FAARC  
Director of Clinical Education  
WESTMED, Inc.  
5580 S. Nogales Highway  
Tucson, AZ 85706  
Cell: (516) 729-9989  
mmcpeck@westmedinc.com  
www.westmedinc.com