As a cost-saving measure, some respiratory therapy departments have been using a single metered dose inhaler (MDI) canister to administer medications to multiple patients. This practice, first described more than a decade ago,1–3 involves a protocol in which the MDI nozzle (mouthpiece) is wiped with a sterile alcohol Prep Pad and then inserted into a patient’s aerosol cloud enhancer spacer with a one-way valve before the medication is delivered (Figure 1). Most protocols also call for disinfecting the nozzle with the alcohol pad after the medication has been delivered. The MDI remains with the respiratory therapist, who then delivers subsequent doses to other patients who require the same drug. The spacer remains with each patient and is not shared. This process, referred to as a common MDI canister protocol, is not used for patients who are prescribed isolation precautions, and it is rarely used for patients undergoing mechanical ventilation.

Proponents of sharing MDIs cite significant cost savings, staff efficiency, and fewer treatment delays. They claim that cross-contamination among multiple users of the MDI is unlikely if the appropriate protocol is followed. Eliminating the need to retrieve and return each patient’s MDI from specific or unit medication supplies—particularly automated dispensing cabinets—has increased staff efficiency. Annual cost savings up to 55% have been documented, and the shared MDIs allow patients to be charged per puff of medication.1–3 Treatment delays associated with pharmacy distribution of MDIs have been eliminated in many cases, and improvements in patient education have also been reported as a result of more one-on-one time with a respiratory therapist.

Those who are opposed to the idea of allowing multiple patients to use the same MDI canister are not convinced that these benefits outweigh even a minimal risk of cross-contamination, particularly if the protocol for disinfecting the nozzle is not followed. Early findings from several hospitals that adopted the practice showed varying results. In one hospital, microbiological sampling of the canisters showed no growth of organisms cultured from the mouthpiece after it was swabbed with alcohol,1 but cross-contamination was documented in two other cases.2,3 In one case, cultures of the MDI nozzle were obtained before and after disinfection with an alcohol Prep Pad as well as after treatments were administered. Growth of Staphylococcus epidermidis occurred in at least 5% of the cultures with all three types of specimens, including those taken after the nozzle was disinfected with the alcohol pad.2 In another case, the hospital assessed the failure to wipe the canister nozzle with an alcohol pad prior to patient use; one culture out of 18 cultures (5.5%) resulted in growth of streptococci group D (enterococci).3 Two studies showed no adverse effects after implementing a common MDI canister protocol.4,5 In one study, no contamination was found for 17 patients at 24, 48, or 72 hours when cultures were taken from the MDI mouthpiece after swabbing with an alcohol pad, after actuation and removal from the spacer, and after removing the mouthpiece from the spacer and swabbing it with alcohol.4 A similarly designed study also showed no growth in cultured samples from the MDIs after the mouthpiece was used by 50 patients.5

Contamination that might occur from a common MDI canister protocol probably comes from the surface of the canister, not from the medication itself. This risk could be decreased by good hand-washing practices and by wiping the canisters with alcohol swabs. However, if staff members are not compliant with hand hygiene between patients—and many are not—how compliant will they be with cleaning the mouthpiece after every patient use? The problem is less serious with the common MDI canister protocol itself and more serious if proper infection-control practices are lacking.

Hospitals that have successfully implemented the common MDI canister protocol state that compliance with disinfecting the MDI nozzle is key, but it is common knowledge that health care practitioners don’t always follow proper procedures. In previous newsletters published by the Institute for Safe Medication Practices (ISMP), there were reports of transmitting blood-borne infections after reusing insulin pens, even after the needle was changed between patients.6 In 2008, the Centers for Disease Control and Prevention (CDC) found that during the 1990s, more than 60,000 patients in the U.S. were at risk for blood-borne diseases resulting from multiple lapses in infection-control practices, including the failure to clean shared glucometers.7 More than 400 patients acquired hepatitis B or C virus infections in patient-to-patient transmission after fundamental infection-control principles were not followed.7

Failure to properly disinfect stethoscopes between patient use has also been linked to nosocomial infections.8 The CDC and the American Medical

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**Figure 1** Metered dose inhaler with spacer device.

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**Medication Errors**

**Shared Metered Dose Inhalers Among Multiple Patients**

Can Cross-Contamination Be Avoided?

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Association recommend disinfecting stethoscopes between patient use, but as a practical matter, this does not happen. Deciding whether to implement a common MDI canister protocol requires thoughtful analysis and deliberation. If the results of earlier studies hold true, a 5% rate of potential cross-contamination might not be acceptable, given the high-volume use of MDIs, the frequency of repeated exposures of MDIs to patients several times each day, and the heightened risk to immunocompromised patients. With shrinking reimbursements for care associated with nosocomial infections, cost-containment gains from employing a common MDI canister protocol may be quickly lost if an infection occurs.

If a hospital decides to use a common MDI canister protocol, the Association for Professionals in Infection Control and Epidemiology (APIC) recommends that the facility carefully analyze its processes to ensure that handoffs between patients are not inadvertent sources of microbial transmission. It is also essential that the institution emphasize hand hygiene and canister disinfection with alcohol after each use and before the next use (Fisher A, personal communication, January 16, 2009). For hospitals that choose to dispense individual MDIs to patients, all manufacturers should provide smaller “institutional” containers of MDIs to prevent unnecessary costs and waste.

The ISMP also suggests that future research involve larger and more diverse patient samples from varied settings to highlight any risks associated with cross-contamination among patients. It would also be useful to conduct studies that show the level of staff compliance with the common MDI canister protocol over time and studies that describe facilitators and detractors related to compliance.

REFERENCES