1. Common canister protocol (CCP)[1-5]

a. Attach a Doser® unit to the newly opened MDI albuterol canister and set the count to 200 (see Doser® instructions).

   (1) Doser® unit will not attach to a ipratropium bromide MDI. Dispose these canisters after 1 year of use since this drug is used infrequently.

b. MDI canisters are distributed to the procedure rooms by the 1st shift personnel.

c. Clean actuators and spacers are kept in the procedure rooms

d. Attach 6 inch corrugated tube spacer to the actuator opening.

e. Prior to patient administration shake the MDI to insure proper mixing of medication and actuate the device twice into the air to alleviate the electrostatic properties of spacer.

f. After each patient the MDI canister tip is cleaned with Sani – Cloth®, the actuator is sent to Central Service for cleaning and the spacer is disposed.

g. Canisters are returned to the locked medication room at the end of the day.

h. Change MDI when Doser count reaches 20.

References:

ALBUTEROL EMITTED FROM A METERED DOSE INHALER: EFFECT OF PRIMING AND TAIL-OFF.

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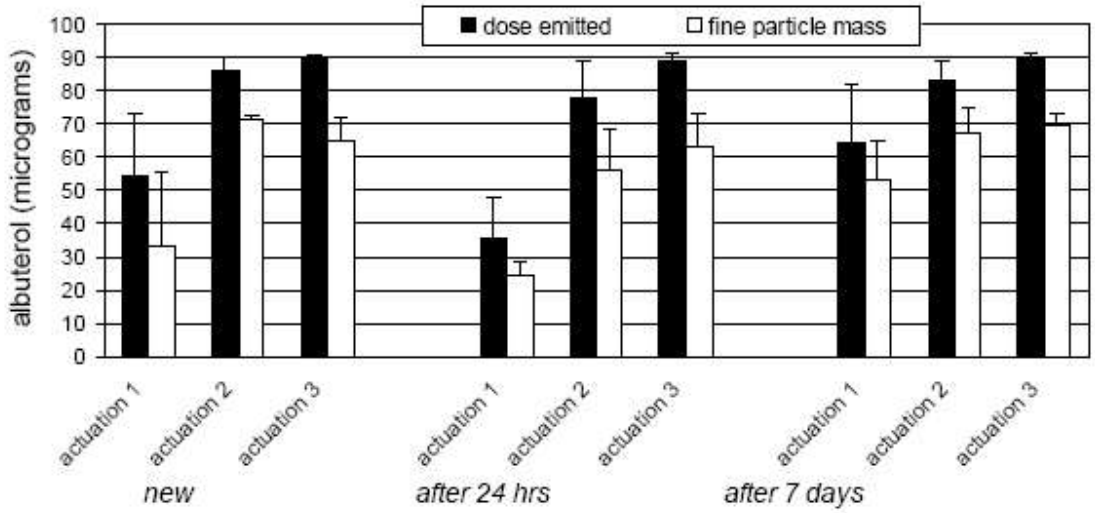
Background: Albuterol is a rescue medication commonly used by patients with reactive airways disease. This may result in infrequent use. We conducted this study to determine the effect of priming and tail-off on the delivered dose from a pressurized metered dose inhaler (pMDI).

Hypothesis: The albuterol dose delivered from a pMDI is affected by priming and tail-off.

Methods: An Anderson Cascade Impactor was used to measure the aerosol emitted from the pMDI. Per manufacturer's instructions, the cascade impactor was operated a flow of 28.3 L/min. The pMDI was held in a vertical position and actuated into the throat of the impactor. Each stage of the impactor was washed with 0.1 N NaOH and assessed for albuterol by spectrophotometry at 243 nm. Albuterol concentration was determined from a standard curve. The total emitted dose was determined by adding the amounts of albuterol deposited on each stage. The fine particle mass was defined as the amount with a mass <4.7 microns. From the priming experiment, 3 new albuterol pMDI (Warrick Pharmaceuticals, Reno NV; nominal dose 90 mcg, 200 actuations) were evaluated. Each was shaken before actuation and several minutes were allowed between actuations. They were assessed new, after 24 hrs of no use, and after 1 wk of no use. For 1 pMDI, tail-off of the dose when it was nearing empty was also assessed.

Results: A summary of the results are shown in the figures. There was a significant difference between actuations for the dose emitted from the pMDI ($P<0.001$) and the fine particle mass ($P<0.001$). There was no significant difference between the new pMDI, after 24 hrs of no use, and after 7 days of no use for total dose emitted ($P=0.46$) and for fine particle mass ($P=0.21$). When the pMDI neared the end of the labeled number of 200 actuations, there was a rapid tail-off in delivered dose - even though the pMDI delivered a total of 217 actuations.



ANALYSIS OF CROSS-CONTAMINATION OF METERED DOSE INHALERS WHEN USING THE RESPIRONICS OPTICHAMBER UNDER THE COMMON CANISTER PROTOCOL.

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Introduction: Many respiratory therapy departments have implemented the common canister protocol (ccp) as a cost-saving mechanism. The purpose of this study was to investigate the safety of administering MDI medications among patients when using the Respironics OptiChamber under the ccp.

Methods: Data were collected from patients receiving MDI medications at the University of South Alabama Knollwood Park Hospital (USAKPH), a 250-bed teaching hospital where the ccp is used. The study involved surveillance of a sequence of three specimen collections obtained from each patient. Specimen collections (specimens A, B, & C), obtained on BBL?CultureSwabs? were cultured on two different media: sheep?s blood and chocolate agar, and analyzed for growth at 24, 48, and 72 hours of incubation. Specimen A was obtained from the MDI mouthpiece following swabbing with an alcohol pad before the MDI mouthpiece was attached to the OptiChamber. Specimen B was obtained from the same location after the MDI mouthpiece was removed from the OptiChamber, following the administration of the medication. Specimen C was obtained from the MDI mouthpiece after swabbing it with an alcohol pad following the removal of the MDI mouthpiece from the OptiChamber. MDI medications administered included Ventolin (albuterol), Atrovent (ipratropium bromide), Flovent (fluticasone), and Serevent (salmeterol). Patients who were in isolation or receiving mechanical ventilation were not included in this study.

Results: The sample subject profile included a total of 50 patients. The 150 (50 patients x 3 cultures/patient) cultured samples demonstrated no growth at 24, 48, and 72 hours of incubation.

Conclusion: Cross-contamination using MDIs among patients in conjunction with the Respironics OptiChamber under the ccp did not occur. Therefore, the ccp is a safe method for administering medications via MDIs using the Respironics OptiChamber. A significant reduction in purchase costs of MDIs is also possible when implementing the ccp. For example, the University of South Alabama Medical Center, which does not use the ccp and spends about $36,144.00/year on MDI medications, would save approximately $19,879.00/year using the ccp.

OF-01-122

[2000] [Open Forum] THE COMMON CANISTER PROTOCOL USING THE MONAGHAN AEROCHAMBER REVEALS NO CROSS-CONTAMINATION AND POTENTIAL COST SAVINGS

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Objective: Many respiratory therapy departments have implemented the common canister protocol (CCP) as a cost-saving measure. The purpose of this study was to determine the incidence of cross-contamination when using the Monaghan Aerochamber under the CCP and the potential cost-savings as a result of the protocol.

Methods: Human subjects approval was obtained and data were collected at a university teaching hospital. The hospital's CCP was followed using the Monaghan Aerochamber. The study involved collection and culture of three specimen collections (cultures A, B, and C) on each subject, on two different media: sheep's blood and chocolate agar. A was obtained from the inside of the MDI mouthpiece following swabbing with an alcohol pad. Specimen B was obtained from the MDI mouthpiece following actuation and removal from the Aerochamber. Specimen C was obtained from the MDI mouthpiece after removing it from the Aerochamber and swabbing with an alcohol pad. Specimens were incubated for 72 hours. Probabilities for the number of positive cultures were calculated from a binomial distribution, with a significance level of 0.05. Previous studies indicated a potential hospital cost-savings of 55% for CCP over providing each patient with their own unique MDI. The current cost of MDIs at another university hospital that provides each patient with their own MDI was multiplied by 0.55 to determine the potential cost savings.

Results: The sample included a total of 17 patients (6 males and 11 females) with a mean age of 54 years. MDI medications administered to the subjects included Flovent (fluticasone), Serevent (salmeterol), Aerobid (flunisolide), Atrovent (ipratropium bromide), and Ventolin (albuterol). There was no growth from any sample at 24, 48, or 72 hours. **Conclusion:** There was no cross contamination of MDIs when using the Monaghan Aerochamber under the CCP. The possibility exists that a 55% reduction in MDI purchase costs may be realized when implementing the CCP. This represents a savings of $13,922 from the present $25,312 spent for individually supplied MDIs at another local hospital.

[1996][Open Forum Abstract]INCIDENCE OF CONTAMINATION OF METERED DOSE INHALER CANISTERS WHEN USED WITH MULTIPLE PATIENTS USING SPACER DEVICES.

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Introduction: The use of a single MDI canister for multiple patients using spacer devices may offer cost savings to both the patient and the hospital, while promoting direct respiratory care practitioner (RCP) instruction and assessment of aerosolized medication delivery to the patient.

Purpose: Concern for potential cross-contamination prompted a pilot surveillance program to assess the presence of pathogens on MDI canisters being used with spacer devices from multiple patients.

Methods: The surveillance was in three phases-Phase I;21 MDI canisters (6 Atrovent, 5 Proventil, 4 Azmacort, 3 Vanceril, 2 Intal and I AeroBid) were collectively used in delivering > 300 MDI treatments to at least 25 different patients over a one week period. A common canister protocol' was followed for these treatments which provides for a single canister to be taken to a patient, the canister nozzle tip wiped with an alcohol prep pad, then inserted into a DHD ACE spacer, and the prescription administered. The same canister was then taken to the next patient, and just prior to administration, the canister nozzle tip was wiped with an alcohol prep pad. The common canister protocol was not used for patients on isolation precautions. At the end of the week, on July 8, 1992 after completing AM. treatment rounds, the 21 canisters were collected, each canister nozzle tip was wiped with an alcohol prep pad to simulate preparation for patient delivery and then environmentally cultured. Phase II: On March 1, 1993, the same process as described in Phase I occurred with 18 canisters and approximately the same treatment/patient volume; however the canister nozzle tips were not wiped with an alcohol prep pad just prior to the culture in an effort to assess the potential results of failure to wipe the canister nozzle tip with an alcohol prep pad prior to patient use. Phase III: On May 10, 1993, the method in Phase I was repeated utilizing 16 canisters whose nozzle tips were cleaned with an alcohol prep pad just prior to the environmental culture.

Results: Phase I: 21/21 cultures resulted in no growth. Phase II: 17/18 cultures resulted in no growth. 1/18 culture resulted in growth of Streptococci Group D Enterococcus. Phase III: 16/16 cultures resulted in no growth.

Conclusions: We conclude that cross contamination of MDI canisters to spacer devices is unlikely when following the common canister protocol as described.

Reference: OF-96-060

2004 Abstracts

Common Canister Protocol vs. Individually supplied MDI's at a 537 Bed Regional Center - a Pharmacoeconomic analysis.

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Background: Respiratory Therapy Departments have implemented the Common Canister Protocol (CCP) vs. individually supplied canisters as a cost saving measure for administering MDI therapy. Only modest published data is available to support the potential cost savings available from this treatment modality. The purpose of this study was the empirical measurement of actual cost savings, if any, attributable to the implementation of a CCP at a 537 bed medical center.

Methods: In April of 2002 the Respiratory Therapy Department implemented a changeover from individual to common canister protocol using the Monaghan Medical **AeroChamber® Plus** valved holding chamber (VHC). In September of 2003, 34 months of MDI units and cost data, representing equal periods pre and post CCP, was collected from The Answer System Morris and Dickson Drug Wholesaler purchase data and analyzed. All MDI medications available for use over the full pre/post analysis period including albuterol, Flovent, Combivent, Alupent, Tilade and Azmacort were studied. Results: Spreadsheet analysis of the units and price revealed a significant reduction in the number of canisters used pre and post conversion (4,506 vs. 1,880). Canister cost rose appreciably in the post conversion period with MDI cost increasing 20.3% (un-weighted) across all medications. To gain an equivalent cost basis for comparison, pre conversion MDI usage was adjusted to reflect the cost increase post conversion, and MDI expense for the two analysis periods was calculated as a built up model from each drug. Overall cost savings from conversion to CCP was $97,758.00 for the first 17 months or an estimated annual savings of approximately $69,000.00. (See Table 1)

			Table 1			
	MDI Units	MDI Units	MDI Units	MDI Units	Avg. MDI	Cost
Medication	Pre CCP	Post CCP	Change	% Change	Cost	Savings
Albuterol (all)	1,885	1,117	-768	-40.7%	$5.01	$3,849.36
Flovent (all)	745	181	-564	-75.7%	60.95	$34,375.80
Combivent	1,045	386	-659	-63.1%	40.81	$26,893.79
Alupent	30	4	-26	-86.7%	25.30	$657.80
Tilade	7	3	-4	-57.1%	36.62	$146.48
Azmacort	794	189	-605	-76.2%	52.62	$31,835.10
Total	**4,506**	**1,880**	**-2,626**	**-58.3%**		$97,758.33

Conclusions: Substantial cost savings resulted from the conversion to a CCP at this facility. No adverse effects have been reported. Although not specifically accounted for, the requirement to track and label individual patient canisters for discharge saved additional time and labor in both respiratory and pharmacy, and offers the potential to reduce discharge medication errors. While the success of a conversion to CCP will depend largely on the cost and mix of MDI medications, the savings realized in this study appear to offer hospitals an important pharmacoeconomic tool for reducing the cost of care while maintaining good clinical practice.