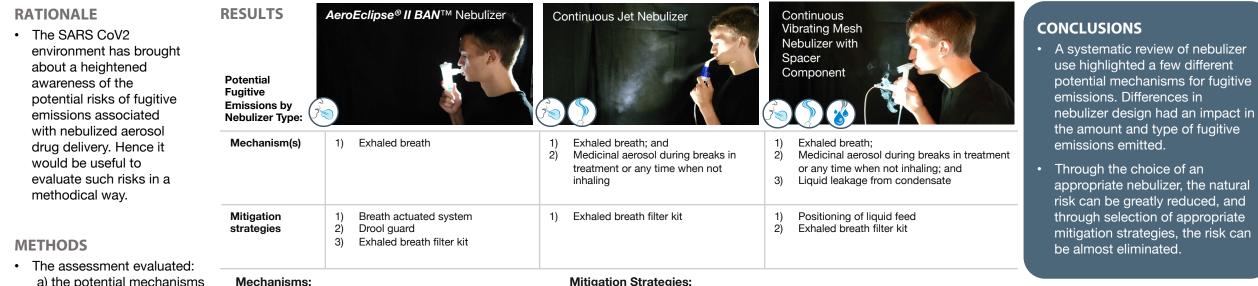
## A Risk Evaluation for Fugitive Aerosol Emissions When Using Different Nebulizer Systems; Potential Mechanisms, Impact of Device Type, and Mitigation Strategies

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## a) the potential mechanisms (routes) whereby nebulizers might emit aerosol or liquid medication into the local environment

b) how such mechanisms may differ depending on the type of nebulizer device; and

c) what mitigation strategies exist to reduce risk.

## Review of various nebulizer types, in their use scenarios, highlight potential fugitive emissions from

the nebulizer when the patient is not inhaling (could be when exhaling or if taking a break during the treatment),

the patient's exhaled breath (bioaerosols); and

the nebulizer as leaking liquid medication and biofilm generated from condensate within the device.

## **Mitigation Strategies:**

- Use of personal protective equipment (PPE) and environmental controls are general approaches (more suitable in hospital environment).
- More specific to the nebulizer itself, in addition to using a breath actuated system, is the ability to separate the liquid aerosol waiting to be nebulized from patient expelled mucosal liquid or droplets. This has the potential to be achieved through the positioning of the liquid feed in the device or through use of a dam to stop such liquid passing back into the medication reservoir.
- Finally, there are a number of different filter kit systems available that capture exhaled aerosol and prevent drug or microbial contamination into the environment. Care should be taken though to ensure that the filter has appropriate efficiency and capacity so as to not become saturated.





