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Common mistakes with asthma devices

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Metered dose inhaler (MDI)

- Sitting down (standing up preferred)
- Using an empty inhaler
- Forgetting to shake or insufficient shaking of canister
- Forgetting to prime (new or not-used-for-awhile inhaler unit)
- Forgetting to clean inside plastic sleeve
- Head position either too flexed or too extended (not in neutral position)
- Mouth not tightly around mouthpiece (for closed-mouth technique only)
- Tongue/teeth in way of mouthpiece opening
- Inhaler directed upward toward palate or down toward tongue
- Double actuations at one time
- Poor coordination/timing with actuation/inspiration (too late or too early with actuation relative to inspiration)
- Stopping inspiration ("freezing") as aerosol strikes throat
- Inspiratory flow rate too rapid; sometimes, too slow
- Inhalation through nose rather than through mouth
- Exhaling during actuation
- Incomplete inspiration
- Too brief of breath-hold
- Open-mouth technique:

- MDI too far from/near to mouth
- MDI not directed into mouth (ie, miss mouth)
- Mouth not fully opened

Nebulizer with mouthpiece

- Not closing lips tightly around mouthpiece
- Not holding nebulizer upright
- Breathing rate too fast, too slow
- Breathing through nose, not mouth
- Stopping too early, before dose done

Spacer/holding chamber

- Sitting down (standing up preferred)
- Using an empty inhaler
- Forgetting to shake or insufficient shaking of canister
- Head position either too flexed or too extended
- Mouth not tightly around mouthpiece
- Tongue/teeth in the way of spacer mouthpiece opening
- Spacer directed upward toward palate or down toward tongue
- Spray all puffs at once into spacer
- Waiting too long after actuation before inhalation
- Start inhalation too early (before actuation)
- Inspiratory flow rate too rapid; sometimes, too slow
- Inhalation through nose rather than through mouth
- Exhaling during actuation
- Incomplete inspiration
- Too brief of breath-hold
- For spacer with mask:
    - Inappropriate mask size
    - Mask not fitting tightly on face over mouth and nose

Dry powder inhaler (DPI): Flexhaler, Diskus, Aerolizer, Twisthaler

- ***Flexhaler***
    - Head position either too flexed or too extended
    - Device not in vertical position for twist/click loading

- Not doing a twist/click before taking a dose (ie, not loading the dose
- Inverting device after loading and losing dose
- Not closing lips tightly around mouthpiece
- Tongue/teeth in the way of mouthpiece opening
- Exhaling into the device before inhalation
- Inhalation through nose rather than through mouth
- Inspiration effort not rapid enough
- Incomplete inspiration
- Not perceiving dose and then repeating dose
- Ignoring counter device, and using empty inhaler as result
- Twist/click device without taking dose (it wastes a dose)
- Not putting cap back on after use

- ***Diskus***
  - Head position either too flexed or too extended
  - Not keeping device in horizontal position when moving lever/inhaling
  - Not closing lips tightly around mouthpiece
  - Tongue/teeth in way of mouthpiece opening
  - Breathing into the device before inhalation
  - Forgetting to move lever before taking dose
  - Moving lever forward then back, rather than just forward
  - Inverting device after loading and losing dose
  - Thinking that inhalation should take place coordinated with moving lever forward
  - Inhalation through nose rather than through mouth
  - Inspiration effort not rapid enough
  - Incomplete inspiration
  - Ignoring counter device, and using empty inhaler as result
  - Opening and closing device without dosing, throwing counter off
  - Forgetting to close device after use

- ***Aerolizer***
  - Head position either too flexed or too extended

- Not puncturing capsule well enough
- Not closing lips tightly around mouthpiece
- Tongue/teeth in way of mouthpiece opening
- Inverting device after loading and losing dose
- Breathing into the device before inhalation
- Inhalation through nose rather than through mouth
- Inspiration effort not rapid enough
- Incomplete inspiration
- Swallowing capsule by mouth rather than inhaling

- ***Twisthaler***
  - Not keeping device in vertical position when removing the cap
  - Head position either too flexed or too extended
  - Not closing lips tightly around mouthpiece
  - Tongue/teeth in way of mouthpiece opening
  - Breathing into the device before inhalation
  - Inhalation through nose rather than through mouth
  - Inspiration effort not rapid enough
  - Incomplete inspiration
  - Covering up the inhalation holes while inhaling the dose
  - Not putting the cap back on after taking the dose
  - Not fully twisting the cap back on and securing it after taking the dose

Nebulizer with mask

- Incorrect size for child
- Not fitting tightly on face/mouth/nose
- Not holding nebulizer upright
- Stopping too early, before dose done

Peak flow meter

- Sitting (should be done standing)
- Inadequate inspiration before blowing into device (big deep breath in is needed)
- Inhaling and taking a deep breath through the peak flow meter before blowing; blowing should be done away from the peak flow meter

- Obstructed mouthpiece (tongue in mouthpiece, mouthpiece in front of teeth)
- Puffing air in cheeks
- Inadequate effort
- Doing long, slow exhalation rather than a quick "punch"
- Spitting or coughing into device
- Head/device jerking with blow

Used with permission from Chitra Dinakar, MD, FAAP, University of Missouri-Kansas City, and Children's Mercy Hospitals and Clinics, Kansas City; and Michael J. Welch, MD, FAAP, FAAAAI, clinical professor, University of California, San Diego, School of Medicine, and co-director, Allergy and Asthma Medical Group and Research Center, San Diego. Dr Dinakar has nothing to disclose in regard to affiliations with or financial interests in any organizations that may have an interest in any part of this article. Dr Welch reports speaker fees and contracted research for Teva Pharmaceuticals.

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