THE IMPORTANCE OF CLINICALLY EFFECTIVE INHALER TECHNIQUE

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Regular Effective Review

**COPD**
- Check inhaler technique
- Ensure diagnosis / severity is correct
- Appropriate pharmacotherapy in line with NICE
- MRC
- Frequency of exacerbations
- Address smoking cessation
- Address hypoxaemia
- Address flu vaccinations
- Appropriateness for pulmonary rehabilitation
- COPD Management Plan
- Appropriateness for palliative care discussions

**ASTHMA**
- Check Inhaler technique
- Check compliance with treatment
- Stepping Up to control symptoms
- Stepping down once control maintained
- RCP 3 questions
- Address smoking cessation
- Asthma management Plan
1. All healthcare professionals prescribing an inhaler should ensure that the patient knows how to use the device (s). If they are initiating it, they should know how to use it and be competent in teaching usage. Initial prescribers should be able to demonstrate device techniques correctly and clearly to the patient and/or carers. This ability should also apply if a clinician is reviewing a patient, and their continued need for medication.
2. If the prescription is for a repeat medication, the prescriber should have assurance that an appropriate assessment of continued need and ability to use has been made and that there is a further appropriate review date planned.

3. No inhaler should be prescribed without knowing that the person receiving it can use it. This may involve watching, instructing, reinforcing and repeating. It should be agreed who is undertaking the role.
4. Device technique should be checked either on the prescribed device or with a relevant placebo device (note these are for single patient use only). Whilst a device may be demonstrated to the patient using a placebo device, once a prescription has been issued, the person’s technique on that device should be reviewed regularly thereafter.

5. Inhaler technique should be an essential part of any respiratory consultation and review.
6. Any proposed changes to an inhaler prescription should be undertaken only after technique and, if possible, adherence is reviewed.

7. No patient should be switched to an alternative device until it has been established that they can use it effectively and they consent to the change.

8. All healthcare professionals who work with people using inhalers should understand the fundamental difference between pressurised metered dose inhalers (pMDI) and dry powder inhalers (DPI) and their inspiratory requirements; pMDI - Slow and steady DPI - Quick and deep
9 Advice should be given on the care, maintenance and storage of the device (including spacer devices) in line with the manufacturer’s instructions.

10. Patients should be advised against regularly testing the device and wasting doses. However, they will need to be advised on priming devices, storage, and how to tell when the devices are empty as not all have dose counters.
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11. A review of inhalers prescribed is an essential part of a respiratory review. Monitoring and addressing adherence should form part of this review.

12. There should be a regular audit of the quantity of inhalers prescribed and collected by individual patients (not just the number of prescriptions), considering all points of access.
### Common Mistakes...

#### Mistakes with pressurized metered dose inhalers (pMDI)

- Protecting cap not removed: **5.35%**
- Inhaler not held upright: **1.78%**
- Inhaler not shaken before use: **57.14%**
- Activation not early enough: **67.8%**
- No slow and deep inhalation: **69.64%**

#### Mistakes with dry powder inhalers (DPI)

- Inhaler not correctly reloaded: **13.6%**
- Mouthpiece not in the mouth: **3.8%**
- No deep and forceful inhalation: **18.53%**

#### General mistakes

- Not deeply exhaled before inspiration: **65.8%**

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Adapted from: Beerendonk van I, Mesters I, Mudde AN, Tan TD. *Assessment of the inhalation technique in outpatients with asthma or chronic obstructive pulmonary disease using a metered-dose inhaler or dry powder device.* 1998. Journal of Asthma; 35: 273-279
What to check...Is the patient getting it right?

- **Observation**
  - Shaking the device if necessary
  - Complete exhalation prior to using device
  - Using device correctly – orientation of device, changing capsules etc, correct technique
  - Waiting between doses if taking more than single dose
  - Maintenance of devices

- **Check Technique at every available opportunity**
  - Do not assume because you taught it once before they have remembered all that you said

- **No side effects**
  - If technique is poor they are likely to report side effects
The good old MDI

- Still most commonly used

- Correct Technique
  - Take cap off
  - Shake
  - Exhale fully
  - Put mouthpiece in mouth
  - Breathe in, slowly and deeply,
  - Depress canister
  - Continue to inhale steadily and deeply
  - Hold breath 10 seconds
  - Wait 30 seconds before next dose.
Comparing DPI with MDI

- Studies have shown only 7.6% of patients use an MDI correctly (Al-Showair et al, 2007)

- Specific Errors Include:
  - 42% errors in flow rate
  - 47% in co-ordination
  - 24% not breath holding
  - 39% not breathing deeply (ADMIT, 2015)

- Supported by further research comparing DPI’s and MDI’s
Breath-actuated/Easibreathe Device

- Research has demonstrated:
  - Greater asthma control than MDI
  - Fewer GP consultations
  - Compared to MDI - A large study of 7412 patients demonstrated that when using ICS, breath actuated devices led to:
    - 25% less SABA use
    - 64% less oral steroid
    - 44% less antibiotics use

Chrystyna H & Price D. *Primary Care Respiratory Journal* (2009); 18(4): 243-249
Spacer devices
Why use a **Spacer with an Inhaler?**

**Inhaler alone**

When an inhaler is used alone, medicine ends up in the mouth, throat, stomach and lungs.

**Inhaler used with spacer device**

When an inhaler is used with a spacer device, more medicine is delivered to the lungs.

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"Comparative respiratory deposition of 99m Tc labeled particles of albuterol using a metered dose inhaler, a metered dose inhaler with Aerocam® spacer and OptiChamber® spacer in healthy human volunteers using gamma-spectroscopy," R. Beilm, PhD, Scintiproc, Inc., Indianapolis, IN and D. Doherty, MD, Dept. of Pulmonology, University of Kentucky Medical Center, Lexington, KY, 1997.

Images kindly provided by Respiromics HealthScan Inc.

**Allies Against Asthma, Center for Pediatric Research, 855 W. Brambleton Ave., Norfolk, VA 23510, 757-668-6435**
Use and Care of Spacer Devices

- The drug should be administered by repeated single actuations of the MDI into the spacer, each followed by inhalation.
- There should be minimal delay between actuation and inhalation.
- Tidal breathing is as effective as single breaths.
- Spacers should be cleaned monthly rather than weekly as per manufacturer's recommendations or performance is adversely affected.
- They should be washed in detergent and allowed to dry in air. The mouthpiece should be wiped clean of detergent before use.
- Drug delivery may vary significantly due to static charge. Metal and other antistatic spacers are not affected in this way.
- Plastic spacers should be replaced at least every 12 months but some may need changing at six months.
If patients don’t know how to use their device it can lead to non-compliance
Non-Compliance

- Not taking medication or other treatment as instructed/prescribed

- More of a problem in asthma than COPD

- Estimates of between 16-41% of respiratory patients are non compliant

‘Evaluation of the scale, causes and costs of waste medicines’, The School of Pharmacy, University of London, 2010.
Why is it a problem?

- Increases morbidity, mortality and expense

How do we address non-compliance?

- Multifactorial but includes:
  - Patient Education
  - Easy to use inhaler device
  - Simple clear instructions

- Spacer with MDI is patients least preferred method of delivery (Onyirimba et al, 2003)
Patient Education

- Clinician demo
- Use of placebos
- Right Breathe  [www.rightbreathe.com](http://www.rightbreathe.com)
- Training devices
- Hand-outs
- Internet
- Pharmaceutical Company websites/material
- BLF
- YouTube
### Differences between DPI and MDI techniques

<table>
<thead>
<tr>
<th>DPI’s</th>
<th>Aerosol MDI’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Larger particles</td>
<td>□ Small particles</td>
</tr>
<tr>
<td>□ Patient has to create the aerosol</td>
<td>□ Device creates the aerosol</td>
</tr>
<tr>
<td>□ Require a fast, forceful inhalation</td>
<td>□ Require a slow, gentle inhalation</td>
</tr>
<tr>
<td>□ Common problem: inhalation is <strong>too weak</strong></td>
<td>□ Common problem: inhalation is <strong>too fast</strong></td>
</tr>
</tbody>
</table>
Speed of inhalation

Good Technique
- 80% swallowed
- 20% deposition

Poor Technique
- 95% swallowed
- 5% deposition
Inspiratory Flow Rate has an Influence on Drug Deposition

As the lungs are the target organs depositing the drug elsewhere can cause side effects

<table>
<thead>
<tr>
<th>Inspiratory Flow</th>
<th>Drug Deposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too Slow</td>
<td>Mouth</td>
</tr>
<tr>
<td>Too Fast</td>
<td>Throat</td>
</tr>
<tr>
<td>Correct Speed</td>
<td>Lungs</td>
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</tbody>
</table>
Problems Associated with Inhalers

Device and Technique
Inhaler devices
www.rightbreathe.com
Problems Associated with Inhalers..

- Patients are on multiple different devices for different symptoms and these require different techniques
- Shape/Colour
- Ease of use
- Lack of dose counter/too small to see
- Multi-step technique
- Dexterity problems
- Co-ordination
- Lack of feedback that dose has been delivered
- Risk of double dosing
Educating and Checking patients..

- [Link to YouTube video](https://m.youtube.com/watch?v=bGCfCGw9h24)
New Device!! Measuring inspiratory flow rate
# Genuair

<table>
<thead>
<tr>
<th>Step</th>
<th>Instructions</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Check dose counter</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Remove cap by squeezing arrows and pulling</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Hold inhaler so large coloured button is facing straight up</td>
<td></td>
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<tr>
<td>4.</td>
<td>Without tilting inhaler, press and release the button</td>
<td></td>
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<tr>
<td>5.</td>
<td>Check control window has changed from red to green</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Breathe out gently, away from the inhaler</td>
<td></td>
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<tr>
<td>7.</td>
<td>Place mouthpiece in mouth and close lips to form a good seal. Keep inhaler horizontal.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Breathe in strongly and deeply. Keep breathing in after click is heard</td>
<td></td>
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<tr>
<td>9.</td>
<td>Hold breath for 5 seconds or as long as is comfortable</td>
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<tr>
<td>10.</td>
<td>While holding breath, remove inhaler from mouth</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Breathe out gently, away from inhaler</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Check control window has changed to red</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Replace cap to cover the mouthpiece</td>
<td></td>
</tr>
</tbody>
</table>

Score: /13

Feedback:
Placebos

- All pharmaceutical representatives are happy to supply placebos/education material – many companies offer a self order service
Thank you.