INHALER TECHNIQUE
Inhaler Devices

• The first official formulae of inhalation medicines were listed in the British Pharmaopoeia (1867).

• Five formulae are described, including:
  – hydrocyanic acid - which was used for the treatment of dry cough, however, in large doses it is lethal as it can paralyse respiration.
  – Vapour of hemlock is also described, it was also used as a treatment for cough.
  – Vapour of creosote is also described, this was used as a treatment for tuberculosis and bronchitis.

Invented 1865: Nelson inhaler (the original inhaler).
Quick Quiz

1. How many different **inhaler devices** can you name?
Here are the main ones!

- Metered Dose Inhaler
- Easi-breathe
- Autohaler
- Turbohaler
- Accuhaler
- Dischaler
- Easyhaler
- Handihaler
- Respimat

- Clickhaler
- Novolizer
- Pulvinal inhaler
- Others
  - Integra
  - Spacehaler
  - Syncroner inhaler
Considerations in selecting an inhaler device

- **Health care Professional Factors:**
  - Availability of drug in device
  - Licence
  - Cost
  - Consistency of delivery
  - Compatibility with other devices
  - Easy to teach technique
  - Effectiveness of the device

- **Patient Factors:**
  - Preference and acceptance
  - Ability and dexterity
  - Inspiratory flow rate
  - Lifestyle
  - Taste
Check Inhaler technique

• Overall, up to 90% of patients show incorrect inhaler technique in clinical studies

• Patients’ inhaler technique can be significantly improved by brief instruction given by trained HCP
  – However, 25% of patients have never received verbal inhaler instruction.
  – Only an estimated 11% of patients receive follow-up assessment and education

• Ask “Can you show me how you use your inhaler?”
  – 75% of patients using an inhaler for on average 2-3 years reported they were using their inhaler correctly but on checking only 10% demonstrated correct technique (Basheti IA et al (2008))
Patients do the funniest things!
All real examples taken from the Medicine Management Collaborative [Anna Murphy]

• A man was asked to demonstrate his inhaler technique. He pointed the inhaler at his chest and sprayed ………!!!

• An elderly man complained that his inhaler was not working. He was asked to demonstrate his technique. He asked for a tablespoon. He shook his inhaler, sprayed two doses onto the spoon then licked it off!

• The asthmatic, her inhalers and her cat …..

• A patient I visited had been using excessive salbutamol inhaler quantities …….
Examples of ‘Poor’ Technique
What amount of drug inhaled do you think actually reaches the lungs with the following devices?

- MDI
- MDI with large volume spacer
  - Turbohaler
  - Accuhaler

80-100% / 60-80% / about 50% / 30-50% / 20-30% / 10-20% / less than 10%
What factors affect lung deposition?

- Patient co-ordination
- Particle size
- Effect of resistance of inhaler device
  - MDI < DPI
- Inspiratory Flow
Using the *In-Check* DIAL inspiratory flow meter

- 26-70% of patients using pMDIs fail to inhale at the correct rate – appropriate to the type of inhaler

- The *In-check* DIAL is a tool for demonstrating to patients how to use their inhaler and then coaching correct technique

- It measures inspiratory flow
  - Optimal inspiratory flow rates for pMDIs
  - High inspiratory rates with pMDIs result in decreased total lung deposition

MDI and DPI inhalation technique COPD: inhalation too fast for pMDI or too slow for DPI

Health Professional speed of inhalation when asked to inhale as if using a MDI

Total 3271 tests conducted – Over 94% inhaled too fast

Presented Jon Bell, ERS 2007
Checking pMDI inhaler technique during the NMS / tMUR

- Use a placebo canister in the patient’s inhaler

- Observe the patient using their own inhaler (assess co-ordination of medication discharge with inhalation)

- Remove placebo canister after use

- Explain the benefits of inhaling gently and holding breath

- Ask the patient to practice holding their breath for 10 seconds or as long as is comfortable
# Optimum Inspiratory Flow

<table>
<thead>
<tr>
<th>Inhaler</th>
<th>L/Min</th>
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<tbody>
<tr>
<td>Accuhaler/Diskus</td>
<td>D</td>
</tr>
<tr>
<td>Turbohaler</td>
<td>T</td>
</tr>
<tr>
<td>Turbohaler (combination)</td>
<td>S</td>
</tr>
<tr>
<td>Autohaler</td>
<td>A</td>
</tr>
<tr>
<td>Low resistance pMDI</td>
<td>M</td>
</tr>
</tbody>
</table>

- **Accuhaler/Diskus**: D
  - Ref: 1, 2, 3, 4, 5
- **Turbohaler**: T
  - Ref: 1, 3, 6, 7, 8, 9
- **Turbohaler (combination)**: S
  - Ref: 1, 3, 6, 7, 8, 9, 10
- **Autohaler**: A
  - Ref: 11, 12, 13, 14
- **Low resistance pMDI**: M
  - Ref: 13, 14, 15, 16

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Using the *In-Check* DIAL during the NMS / tMUR

- Explain that you are going to check how the patient uses their inhaler
- Set the dial to represent the patient’s inhaler
- Insert a disposable mouthpiece and ask the patient to inhale as they normally would when using their inhaler
- Show the patient where the wheel stops relative to the range for their inhaler
- Reset and repeat - this time, ask the patient to inhale gently
- Coach them to match their inspiration technique to the zone for their inhaler
- Allow them to practice enough to feel what the right inhalation rate is for their inhaler
Inhaler Technique Workshops
In groups of four to six, practice using the *In-Check DIAL* inspiratory flow meter

1. Set the *In-Check DIAL* to Turbohaler icon
2. Insert disposable mouthpiece with arrow pointing towards you i.e. in direction of airflow
3. Tap the blue end of the device gently on the table – this sets the red flow meter wheel at bottom
4. Tip the device to ensure the magnet moves toward the white end of the device
5. Inhale through the mouthpiece, note where the red wheel aligns to the scale and record your result
6. Remove the mouth piece and pass to the next member of your group who will follow the same exercise
Practice 2

1. Change the setting to the pMDI icon
2. Repeat steps 2-6 from Part One

Final Task

1. Keep the setting at the pMDI icon
2. Repeat steps 2-7 from Part One

This time coach your colleagues on what they need to do in order to achieve a result which is in the correct range
Metered dose inhalers (MDI)

• Cheap, Quick & convenient to use
• 80% of UK asthma patients currently use pMDI aerosols
• Poor inhaler technique is common
• When used correctly only 10%-20% of the drug reaches the lungs
• May continue to deliver propellant after active drug gone if not shaken correctly
• Important to wait 30-60 secs between doses due to 2nd actuation being of poorer quality
Most common errors of pMDI inhalation technique

• Inadequate shaking of canister before inhalation
• Inhaling too fast or too slowly
• Failing to co-ordinate aerosol firing with inhalation
• Ceasing inhalation after firing of aerosol
• Insufficient duration of breath-holding after inhalation
Questions?