Technology-Based Interventions to Promote Adherence

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Interventions

Question Prompt List with Videos
Tailored Inhaler Technique Videos
Inhaler Tracking Device

Asthma Apps
Question Prompt List and Self-Management Videos
Delivered in primary care setting
Development

Created six 1-2-minute educational videos and question prompt lists in English and Spanish to motivate teens to be more actively involved during medical visits and ask the medication-related questions they have for their providers

- QPL questions based on real questions teens asked their providers during asthma visits
- Video topics based on themes that emerged from focus groups with teens (ages 11-17), parents, and pediatric providers

QPL and video used at each asthma visit

Questions about asthma medicines:

- What do you call my asthma medicine?
- What medicine do I use when my chest is tight or when I wheeze or cough?
- Which asthma medicine do I take every day and why?
- How do I use a spacer?
- When should I use my medicine?
- How much medicine should I take each time I use it?
- How long do I hold my breath after I inhale my medicine?
- Why do I hold my breath after I inhale my medicine?
- How many times a day do I take it?
- Should I use my asthma medicine before I play or exercise?
- Is it okay to take my asthma medicine with my other medicines?
- Can you show me how to use my medicine?
- Can I show or tell you how I use my medicine so you tell me if I am doing it right?
- Should I always carry my asthma medicine with me?

Write any other questions you have in the space below:
Six Videos

1. How to get mom off your back
2. Asthma triggers
3. Staying active with asthma
4. Tracking asthma symptoms
5. How to talk with your doctor
6. Having confidence with asthma

https://www.youtube.com/channel/UCSbQklyoYDLuwa-xKeGliQ
Results

Enrolled 40 providers and 359 youth with asthma

Youth in the intervention group were significantly more likely to ask one or more questions about medications, triggers, and environmental control than youth in usual care.

Providers were significantly more likely to educate youth about rescue medications, triggers, and environmental control if youth were in the intervention group.

Most teens do not return for their 6-month asthma visits
Tailored Inhaler Technique Videos
For non-adherence related to execution errors
Implemented in school setting
### Why Inhaler Technique?


<table>
<thead>
<tr>
<th>TABLE 1 Metered Dose Inhaler Device Technique</th>
<th>Percent (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steps used by all children who stated they used a metered dose inhaler (N = 270)</td>
<td></td>
</tr>
<tr>
<td>Remove cap from inhaler</td>
<td>97.3 (256)</td>
</tr>
<tr>
<td><strong>Shake inhaler 4–6 times</strong></td>
<td>44.4 (116)</td>
</tr>
<tr>
<td><strong>Exhale normally</strong></td>
<td>36.2 (93)</td>
</tr>
<tr>
<td>Tilt head back slightly, with inhaler upright, place mouthpiece between lips or 1–2 inches in front of a wide open mouth</td>
<td>83.9 (218)</td>
</tr>
<tr>
<td>Between a slow deep breath</td>
<td>81.7 (214)</td>
</tr>
<tr>
<td>Press inhaler canister once at beginning of breath</td>
<td>84.0 (220)</td>
</tr>
<tr>
<td>Continue to inhale for 3–4 s</td>
<td>63.9 (166)</td>
</tr>
<tr>
<td><strong>Hold breath for 10 s</strong></td>
<td>32.6 (85)</td>
</tr>
<tr>
<td>Wait at least 30 s and repeat steps 2–8 if using another puff*</td>
<td>27.2 (69)</td>
</tr>
<tr>
<td>Children who performed all steps correctly</td>
<td>8.1 (22)</td>
</tr>
</tbody>
</table>

Steps used by children who stated they usually used a spacer who demonstrated spacer use (N = 69):
- Remove cap from inhaler: 95.5 (64)
- **Shake inhaler 4–6 times**: 42.4 (28)
- **Exhale normally**: 52.2 (35)
- Tilt head back slightly, place mouthpiece between lips, holding inhaler upright: 80.6 (54)
- Press inhaler canister once to place dose in holding chamber: 91.0 (61)
- Begin a slow deep inhalation immediately after placing dose in holding chamber (3–4 s): 83.6 (56)
- **Hold breath for 10 s**: 48.3 (31)
- Wait at least 30 s and repeat steps above if using another puff*: 40.3 (27)

Children who performed all steps correctly: 20.3 (14)
Demographically Tailored

Gender (M, F)
Age (younger, older)
Race (B, H, W)
Language (Eng, Sp)
Step 4: Feedback (Metered Dose Inhaler with Spacer)

Steps: MDI & Spacer

- 1) Remove cap
- 2) Shake 5 seconds
- 3) Attach spacer to inhaler
- 4) Breathe out normally
- 5) Tilt head and place between lips
- 6) Press inhaler
- 7) Breathe in deeply and slowly
- 8) Hold breath for 10 seconds

Also tailors on the steps the child performs incorrectly!
DEMONSTRATION
Asthma Project: Tailored Inhaler Technique Intervention

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Developed by Polyglot Systems, Inc. (v.1.5 5/2016)
Pilot Test

7 school nurses
25 students
1-month follow-up

Technique assessed before and immediately after video
Also assessed 1-month later
### Changes in MDI Technique (Without Spacer)

<table>
<thead>
<tr>
<th>MDI without spacer (n=16)</th>
<th>Before Video</th>
<th>After Video</th>
<th>1-month</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N(%)</td>
<td>N(%)</td>
<td>N(%)</td>
</tr>
<tr>
<td>Remove cap from inhaler</td>
<td>12 (75%)</td>
<td>16 (100%)</td>
<td>16 (100%)</td>
</tr>
<tr>
<td>Shake inhaler 4-6 times</td>
<td>5 (31%)</td>
<td>16 (100%)</td>
<td>16 (100%)</td>
</tr>
<tr>
<td>Exhale normally</td>
<td>6 (38%)</td>
<td>14 (88%)</td>
<td>14 (88%)</td>
</tr>
<tr>
<td>Tilt head back slightly, place mouthpiece between lips or 1-2 inches in front of a wide open mouth</td>
<td>10 (63%)</td>
<td>15 (94%)</td>
<td>16 (100%)</td>
</tr>
<tr>
<td>Begin a slow, deep breath</td>
<td>9 (56%)</td>
<td>13 (81%)</td>
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</tr>
<tr>
<td>Press inhaler canister once at beginning of breath</td>
<td>14 (88%)</td>
<td>16 (100%)</td>
<td>13 (81%)</td>
</tr>
<tr>
<td>Continue to inhale for 3-4 seconds</td>
<td>9 (56%)</td>
<td>12 (75%)</td>
<td>14 (88%)</td>
</tr>
<tr>
<td>Hold breath for 10 seconds</td>
<td>7 (44%)</td>
<td>13 (81%)</td>
<td>15 (94%)</td>
</tr>
</tbody>
</table>
**Statistical Tests**

**Immediate**
- With spacer: 6.4 steps to 7.6 steps ($p=0.03$)
- Without spacer: 4.5 steps to 7.2 steps ($p<0.01$)

**One-month follow-up**
- With spacer: 6.4 steps to 8.0 steps ($p=0.01$)
- Without spacer: 4.5 steps to 7.3 steps ($p<0.01$)

Other Devices
Inhaler Compliance Assessment Device
INCA Device

This image shows us the full recording of an inhaler being opened, drug being primed, inhaling and exhaling.

Feedback & Improved Technique

Graph 1 - Month 1 of Study.

Graph 2 - Month 2 of Study
My Contact Info

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