



Clinicians and Their Chronically Ill Pediatric Patients Together Can Improve Medication Adherence and the Use of Health Care Services

When children and adolescents with asthma, diabetes, epilepsy, or inflammatory bowel disease, or other chronic illnesses, forget or decide not to take their medications, they are more likely to have the kinds of symptoms that require a trip to the emergency department or a stay in the hospital. A recent report in *Pediatrics* suggests that improving medication adherence in chronically ill children with asthma or type 1 diabetes, may help reduce emergency department visits, hospitalizations, and related costs.^{1,2}

Resources for Caregivers

The Center for Adherence and Self-Management at Cincinnati Children's Hospital Medical Center has developed patient-friendly tools to help caregivers manage medication adherence in children and adolescents. These resources can be downloaded at www.cincinnatichildrens.org/research/divisions/c/adherence/parents/.

- Helping Your Child Manage Medication Treatment Effectively (tip sheet)
- Adherence Strategies Tip Sheet
- Keeping Track of Your Child's Medication Taking (medication calendar)
- Problem Solving Guide for Family Members
- Helping Your Child Swallow Pills (tip sheet)
- Helping Your Child With Eczema and Other Skin Conditions (behavior change plan and habit reversal training)
- Helping Your Child With Sickle Cell Disease (pain management plan with a self-management program)

Electronic Interventions for Clinicians

Clinicians can take a more active role in promoting medication adherence among their chronically ill pediatric patients. On the next page are some monitoring devices that track medication adherence. Many of these devices include patient and/or caregiver reminders, reward systems, and/or information transmission services that may help clinicians and families address some of the barriers to medication adherence. Clinicians should consider the specific needs of their pediatric patients to determine if using these or similar devices in their practice may enhance efforts to improve medication adherence.

¹ McGrady ME, Hommel KA. Medication adherence and health care utilization in pediatric chronic illness: a systematic review. *Pediatrics*. 2013;132(4):730-40. PMID:23999953.

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DEVICE	DESCRIPTION (WEB SITE)
Adhere Tech	Pill bottle that measures the contents at regular intervals and wirelessly uploads data to a server. Sends reminders to patients when doses are missed. (www.adheretech.com)
Asthmopolis	Monitors adherence to asthma medications and syncs with mobile application for reminders, tracking, and sharing with physicians. (www.propellerhealth.com)
Dispense a Pill	Reminds, dispenses, and monitors medication. Communicates via phone line with caregivers. (www.healthonemed.com/dispense_a_pill_p/100.htm)
E-pill MD2 MedSmart	Multi-Alarm Pill Box and Easy-to-Set Pill Timer. Provides reminders for up to 37 doses per day. Indicates missed doses by a "Missed Pill" indicator on the display. (www.epill.com/multiplus.html)
Electronic Medication Management Assistant	Sorts, selects, and delivers medication. Remotely controlled by a pharmacist or nurse. Provides reminders and alarms. (www.inrangesystems.com/#1)
Gecko Cap	Added to inhalers to remind children and monitor adherence. Records data and communicates with a mobile app to inform parents of taken and missed doses. Provides printouts for providers and includes a behavior reinforcement system. (www.geckocap.com/about)
GlowCaps®	For pharmacy bottles. Has a wireless chip that enables personal reminders, pharmacy refill ordering, weekly updates to a family member, and printed reports to physicians (www.vitality.net/glowcaps.html)
MedFolio Pill Box	Electronic pillbox with detachable pill boxes and pill identification system. Provides audio alerts, visual light reminders, and connects to a software program that delivers email and text reminders. (www.medfoliopillbox.com)
MedMinder™ Maya	A 7-day pillbox with four compartments for each week day. Reminds patients to take medication with flashing lights and automated reminders (calls, text, email). Information transmitted to an online database. Caregivers and health care providers can access adherence data. (www.medminder.com)
MEMS	Medication bottles with caps that record the time and date of each opening and closing. (www.mwvaardex.com/Products/DataCollection/MEMSCap)
MedSignal®	A four-compartment pill box with alerts/reminders. Includes an ability to provide data reports. (www.medsignals.com)
MedSmart PLUS	E-pill MedSmart MD2 PLUS Monitored Automatic Pill Dispenser reminds and dispenses medications up to six times per day. Connects to a landline to notify caregivers of missed doses by phone, email, or text message. (www.epill.com/medsmartplus.html)
Monthly Pill Box	A monthly pillbox with four daily compartments. Alarm and voice reminders sound until patients press "acknowledgment button," which allows users to see that doses have been taken. (www.epill.com/31day-pillbox.html)
SimpleMed	A 7-day pillbox with four compartments for each day. Reminds patients to take medication with audible and visual reminders and automated reminders (calls, text, email). Information is transmitted via landline coverage to online database. Caregivers and providers can access adherence data. (www.vaica.com/products)
Tab Safe®	Modularly expandable unit that reminds, dispenses, and connects to a personal health Web site. Programmed on the Web site by patients, caregivers, or health professionals (www.tabsafe.com)

Sources

The information in this handout comes from the Center for Adherence and Self-Management at Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio, which works to optimize health outcomes for patients and their families by promoting self-management and adherence to medical treatments, by conducting state-of-the-art science, delivering innovative clinical care, and providing specialized training programs for the next generation of clinicians and scientists. To learn more about the center, go to: <http://www.cincinnatichildrens.org/research/divisions/c/adherence/default/>.

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