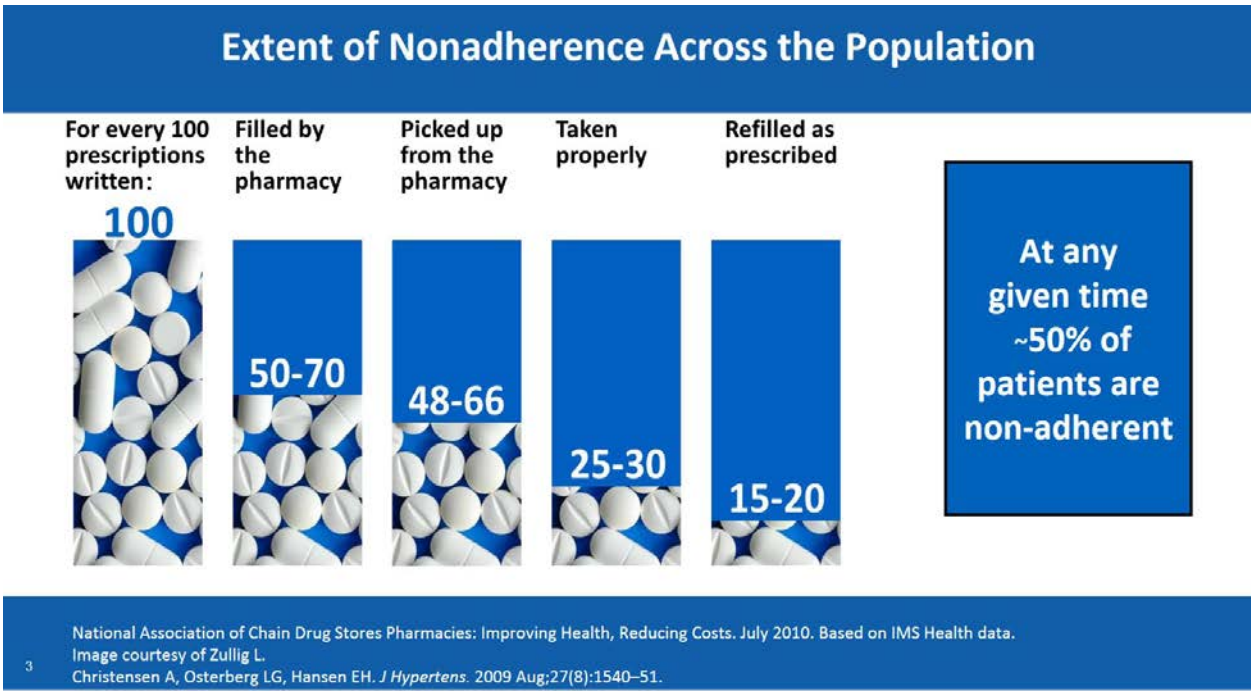
Medication adherence
Skills



Long term use of medication is fundamental in the treatment of chronic illnesses, yet relies upon patient adherence to result in positive outcomes. Adherence is the degree to which a person's behavior corresponds with agreed prescriber recommendations as it applies to taking medications, following a diet, or executing lifestyle changes. Unfortunately, lack of medication adherence is prevalent with a projected 50% of patients with chronic illnesses not taking medications as prescribed, resulting in increased morbidity and mortality, hospitalizations, and an approximate cost to the healthcare system between $100-$289 billion per year. *Frontiers in Pharmacology* published a review study matching adherence interventions to patient determinants. The RxLive team categorized the reasons for medication adherence into six major buckets — Cost, Side Effects, Skills, Understanding and Knowledge, Social and Behavioral factors, and Access to Care and Burden of Regimen. Pharmacists are integral in improving patient medication adherence through their unique training coupled with their position and accessibility in the healthcare chain. The RxLive technology platform gives pharmacists additional tools and suggestions to address adherence problems they identify in the course of their practice.

Skills: influence on medication adherence

Patients' ability or proficiency expressed as skill sets affect medication adherence. Skill levels affect use of drug delivery devices, memory retention, communication, physical capabilities and confidence.

Drug delivery devices add another layer to medication adherence, requiring the correct use of the device for medication delivery. *Annals of Allergy, Asthma & Immunology* published that literature documents up to 92% of asthmatic patients use inhalers incorrectly and correct use of epinephrine auto-injectors is as low as 22%. Accurate use of drug delivery devices relies on multiple skill sets that vary between individuals and patient populations including physical skills, memory retention and confidence.

Other causes of improper device use result from lack of patient or caregiver understanding, complicated or absent instruction manuals, device usability, health literacy, and environmental unpredictability in uncontrolled home environments.

Forgetfulness and memory retention skills are a common source of medication nonadherence. The Express Scripts ScreenRx program studying adherence among patients with hyperlipidemia, hypertension and diabetes, revealed that 69% of subjects were non-adherent due to behavioral issues and skills such as forgetting and procrastination. A study in the *Journal of Neuroscience* demonstrates that memory formation is affected by acute stress, making learning more difficult for people experiencing stress. Additionally, the historical Ebbinghaus' forgetting curve, recently replicated, reveals memory retention of learned knowledge decreases over time unless it is consciously and repetitively reviewed. Memory retention skills and metacognitive skills are an increased challenge among the elderly population who are more prone to confusing dosing for concurrent medications, having prior medication regimen recollection interfere with newer regimens, and experiencing difficulty associating paired items or instructions for a regimen such as taking a medication with food in the morning. However, growing research also shows low medication adherence rates in young adults. Express Scripts reported in a 2016 assessment of 1.4 million diabetic subjects, that 50% of those aged 20-44 were not adherent to oral diabetic medication, indicating forgetfulness as an imposing factor in their overall study. Memory retention skills in younger adults are affected by stress, technology[1, 2], media multitasking increasing propensity of attention lapses, and disconnect between comprehending long-term consequences of immediate actions.

Communications skills impact medication adherence, with a reported 40-60% of patients unable to correctly communicate physician directions regarding prescribed medications 10-18 minutes after being provided the information. Inability to accurately communicate directions affects how they relay their care instructions to other healthcare providers or caregivers, and inhibits useful question sessions which may impact the accuracy of therapy administration.

Diminished physical skills can be caused directly by patients' diseases that may diminish physical stamina and strength, cause fatigue, pain, tremor, cognitive functioning, or alter emotional status. Lack of physical skills affects medication adherence by creating difficulties opening pill bottles, using medical devices, administering medications, and decreasing confidence in their own abilities. Other physical skills impact adherence such as: difficulty swallowing capsules or self-injecting medications, vision deficits impacting focus and color recognition, and inability to walk or drive.

Lack of confidence in one's ability to correctly follow a prescribed medication regimen impairs medication adherence. Confidence-building skills that increase the perception of self-efficacy is correlated with better medication adherence in multiple disease states.[3, 4, 5, 6] Contrastingly, overconfidence can lead to medication nonadherence as reported in studies examining overconfidence in memory skills and personal ability. Overconfidence in memory skills includes those that overestimate their future memory or are unaware of their risk for forgetting, making them less likely to review information. Self-confidence in ability or perception of expertise can lead to medication nonadherence as exhibited in a study published in *Ergonomics* where patients deviated from prescribed medication regimens, self-adjusting their doses in special circumstances such as consuming a high salt meal or in relation to how they perceived their bodies were functioning at a given time.

How pharmacists can identify patient skill as a barrier to medication adherence

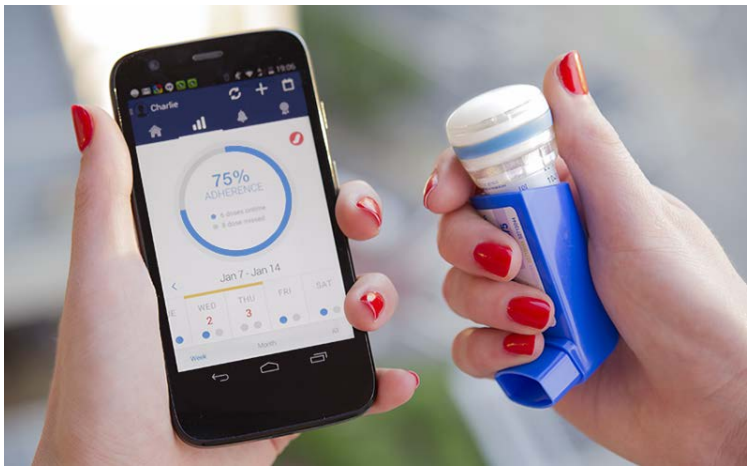
Pharmacists can rely on patient observation during counseling sessions to identify lack of skills. Physical skills, communication skills, forgetfulness, and understanding of devices can be assessed during the teach-back method while observing the patient as they repeat or demonstrate the medication regimen. Pharmacists can identify low confidence by asking questions about their level of comfort using the medication or noticing if the patient appears anxious or says negative things about themselves during the teach-back method.

Identification of nonadherence due to skills can also be identified through patient self-reporting when prompted by open-ended pharmacist or staff questions during pharmacy visits. Identification of a non-adherence risk allows further exploration by the pharmacist to identify if the causative factor is a lack of a certain skill.

How pharmacists can improve medication adherence in regards to patient skills

1. ***Patient self-reporting through pharmacy prompts:***
    - Self-reporting is a simple, low-cost and fast method to identify nonadherence at several different points in the context of pharmacy care. Self-reporting can be acquired via patient questioning or record review at the time of prescription drop-off, refill, or new script counseling. Patient questions or questionnaires should be phrased in an open-ended, non-judgmental manner. However, limitations exist due to inaccurate patient recall or overestimation of adherence for social desirability. Scales for self-efficacy assessment include: The Self-efficacy for Appropriate Medication Use Scale (SEAMS) and Brief Medication Questionnaire (BMQ)
    - Once the reason for nonadherence is identified, such as a lack of skill, the pharmacist can intervene to overcome the barrier through repetition with the teach-back method and offering written reference materials, practice exercises, and technological resources such as instruction videos and websites. If diminished physical skills are interfering with adherence, medications can be packaged in different devices, provided in different dosage forms, or caregivers can be trained to administer it correctly. Forgetfulness can be addressed from both the patient and pharmacy perspective. Pharmacies can implement prescription refill apps, text reminders, phone call services, and systematically run prescription refill-due software reports to identify those needing refills. Pharmacists can recommend to their patients to use medication schedule charts, alarms, pill organizers, patient medication diaries, and organization techniques to store their current medications for ease of accessibility and use.
2. ***Medication event monitoring systems (MEMS)***
    - MEMS are accurate adherence measurement options in clinical situations where patient monitoring is ongoing and medication adherence is being measured by an interdisciplinary team including pharmacists. MEMS include microprocessor technology embedded in medication caps that record the date and time the bottle was opened. Such devices are highly accurate, yet cannot record if more than the prescribed does was removed once opened. They are costly, requiring separate MEMS for each medication, making them impractical for regular community pharmacy use.

3. ***Connected drug devices***



- Connected drug devices link a drug delivery device – auto-injector, smart inhaler, pump - to an app and cloud data system, allowing for drug use monitoring that typically provides data in real time. They are a true representation of medication adherence and can be used to compare patient-reported adherence using self-report scales. These systems improve medication adherence through reduced dosing errors, patient alerts and medication reminders, and adherence data for providers. They present an opportunity for clinical pharmacists to ascertain valuable medication adherence data to utilize in medication therapy management (MTM) services. The connected drug device market is projected to grow 35.4% during the forecast period of 2019-2026, in which pharmacists will have significant opportunities to reinforce training on smart drug delivery devices in both the community and clinical settings.

Summary: Patient skills impact medication adherence

Medication adherence is significantly impacted by patients' skill capacity to use drug delivery devices, retain information through memory formation, communicate, physically function and build confidence. Pharmacies in clinical and community practice can utilize technology such as MEMS and connected devices in addition to patient self-reported data to assess and improve medication adherence. Pharmacists are uniquely positioned to assess for medication nonadherence attributed to patient skill sets with the ability to identify and empower patients through teach-back method training, reinforcement, and instructional materials to build the skills necessary for patients to successfully adhere to their medication regimens.

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