Assessing Medication Adherence

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Objectives

In this presentation, we will review:

• The frequency of medication non-adherence
• Factors influencing adherence
• The adverse effects of non-adherence on clinical outcomes
• Methods to assess adherence
• Some suggested adherence assessment strategies
Objectives

By the end of this webinar, you will be able to:

• Better understand the pervasive issue of medication non-adherence
• Identify factors that influence adherence
• Address non-adherence in practice with your patients
• Utilize adherence assessments strategies
Common reasons why treatment does not work for a particular patient

• The medications are not taken
• If taken, they are not effective
We tend to underestimate the role of non-adherence
Non-adherence in the treatment of chronic disorders

• In developed countries, about 50% of patients with chronic diseases adhere to long-term therapy\(^1\)
• 33–69% of all medication-related hospital admissions in the US are due to poor medication adherence\(^2\)
• One-third of all prescriptions are never filled\(^3\)
• >50% of filled prescriptions are associated with incorrect administration (not taken as prescribed)\(^3\)

U.S. Patients Do Not Take Medications as Prescribed

Rx prescribed: 100%
Rx filled: 88%
Rx taken: 76%*
Rx continued: 47%*

* 22% of U.S. patients take less of the medication than is prescribed

Stopping medication is the most powerful predictor of relapse

- Survival analysis: risk of a first or second relapse when not taking medication ~5 times greater than when taking it

Poor antipsychotic adherence over time in schizophrenia

Analysis of 34,128 VA patients with schizophrenia receiving regular outpatient mental healthcare. Poor antipsychotic adherence defined as annual MPR < .80. 18% had poor antipsychotic adherence in all 4 years.

- MPR = medication possession ratio; VA = Veterans Affairs.
Medication adherence components/phases

- **Initiation**
  - 16% of patients with a new prescription do not commence treatment

- **Implementation – ongoing treatment**

- **Discontinuation**
Factors affecting medication adherence

• Disease factors
• Medication factors
• Demographic and socioeconomic factors
• Patient and family factors
• Health care system factors

Lehmann et al 2014
Factors affecting medication adherence

• Disease factors
  • Severity of illness
  • Presence/absence of current symptoms
  • Concurrent disorders
    • Substance use
    • Cognitive disorders

Adapted from Lehmann et al 2014
Factors affecting medication adherence

• Medication factors
  • Complexity of treatment
  • Duration of treatment
  • Medication side effects

Adapted from Lehmann et al 2014
Factors affecting medication adherence

• Demographic and socioeconomic factors
  • Education
  • Financial resources
  • Cultural background

Adapted from Lehmann et al 2014
Factors affecting medication adherence

• Patient and family factors
  • Disease and medication knowledge/beliefs
  • Experience with treatment (e.g., acute episodes, relapse)
  • Self-care skills

Adapted from Lehmann et al 2014
Factors affecting medication adherence

• Health care system factors
  • Patient-care provider relationships
  • Access to care

Adapted from Lehmann et al 2014
Challenges in medication adherence assessment

• As we have discussed, multiple factors can affect adherence
• Medication adherence for an individual can vary over time
• We all want a simple, valid and reliable method to assess adherence but what we have are multiple methods each with limitations
Adherence assessment method types

- Direct methods measure ingestion of medication
- Indirect methods measure proxy measures of adherence
Direct methods: Monitoring of medication or metabolite levels in blood or urine

**Advantages**
- Proven ingestion

**Disadvantages**
- Not available for all medications
- Covers short-term adherence (dependent on medication half-life) around time of collection
- Subject to intra- and inter-patient metabolism variability
- Delay in obtaining results
- Costly
- Uncomfortable (when blood draw required)
Direct methods: Ingestible event markers

- A microsensor embedded in medications which emits a signal once a medication is ingested
- The signal is detected by a skin patch sensor (other sensor types in development)
- Software records the medication ingestion
Direct methods: Ingestible event markers

**Advantages**
- Proven ingestion
- Provides adherence feedback to patient and others with patient approval
- No delay in obtaining results
- Can collect data beyond solely adherence

**Disadvantages**
- Only recently FDA approved for use with a version of aripiprazole
- Requires patient cooperation with patch and other data collection procedures
- Costly
Direct methods: Staff observation of medication taking

Advantages
• Proven ingestion of medication with injectable medications
• With oral medications, high likelihood of ingestion
• Allows monitoring of multiple medications

Disadvantages
• Can be costly in terms of staff time for oral medications
• In outpatient settings, it is difficult to observe adherence every day—e.g., staff work only certain days of the week, patients do not come to the clinic daily
• “Cheeking” of oral medications
Indirect methods: Electronic devices

• The medication package is fitted with an electronic microchip that records the date and time that the package is opened
Indirect methods: Electronic devices

Advantages
• Longitudinal measure of medication intake (date and time recorded for each use of the device)

Disadvantages
• Not a direct measure of adherence
  • Patients can open medication bottle but not ingest medication
  • Patients may take medication from supplies other than those associated with the device
• Requires patient cooperation
• Logistical issues about getting medications into the devices
• Difficult to monitor multiple medications
• Costly
Indirect methods: Pharmacy refills and prescription claims databases

**Advantages**
- Can assess large numbers of patients
- If a clinic has preexisting access to the databases, costs can be minimal
- Allows monitoring of multiple medications
- Can be useful for screening for patients with poor adherence

**Disadvantages**
- No monitoring of medication ingestion
- Does not capture daily intake variation
- Can be inaccurate for patients who get medications from multiple sources
Indirect methods: Pill counts

**Advantages**
- No costly equipment needed
- Allows monitoring of multiple medications

**Disadvantages**
- Does not assess daily variability in adherence
- Does not prove that medication has been swallowed
- Patients have to return pill-containers at each visit
- Inaccurate if patients intend to deceive or have multiple sources of medication
- Requires staff time
Indirect methods: Patient self-report

• Include interviews, questionnaires or diaries

• Measures vary widely
  • For general vs. disease-specific use
  • Format, questions, and measurement scales differ
  • Focus upon intentional vs. unintentional non-adherence

• Data collected varies
  • Recall of medication ingestion
  • Factors that can impact adherence
    • Beliefs
    • Social and environmental factors
Indirect methods: Patient self-report

**Advantages**
- Low cost
- Low staff burden

**Disadvantages**
- Overestimates level of adherence
- Subject to recall issues and social reluctant to admit non-adherence
- Limited ability to determine variability of adherence over time
Indirect methods: Interviewing significant others

**Advantages**
- Depending upon the method, costs can be low

**Disadvantages**
- Data may vary with the quality of the relationship
- Subject to recall issues and social reluctance to admit non-adherence
- Limited ability to determine variability of adherence over time
- Staff time maybe required
Indirect methods: Healthcare provider report

Advantages
• Low cost
• Low staff burden

Disadvantages
• Lack of reliability
• Subject to recall issues and social reluctance to admit non-adherence
• Limited ability to determine variability of adherence over time
Concordance between different assessment types

• Garber and colleagues (2004) examined the concordance between adherence based upon self-report measures and based upon non-self-report measures (administrative claims, pill counts or canister weights, plasma drug concentrations, electronic event monitor, clinical opinion) from 86 adherence studies

• In 37 of the 86 studies (43%), there was high concordance

• In a subgroup of 31 studies with electronic measures, high concordance was found in only 5 studies (17%)
Percentage of non-adherent patients identified by different methods

Nonadherence defined on the basis of electronic monitoring. Nonadherent patients took <80% of prescribed medication over a 12-week period.

A common mistake to avoid

• *Don’t confuse adherence with current symptom level*
• In the period before relapse occurs, non-adherent patients may have few symptoms
• Unfortunately, not all patients improve with our treatments; adherent patients sometimes have a lot of symptoms
Clinical implications

• Non-adherence is pervasive and is a major cause of poor patient outcomes
  • Enhancing adherence should be a substantial focus for all clinics
Clinical implications

• **What we want** in adherence assessment method(s) for our clinics:
  • Great accuracy
    • Distinguishing the non-adherent, partially/intermittently adherent and highly adherent populations
    • Ability to track adherence variability within an individual
  • Ease of assessment
  • Low cost

• **What we currently have** in adherence assessment method(s) for our clinics: greater accuracy often comes with greater assessment effort/greater cost
Some strategies to consider

• Long-acting medication formulations substantially simplify adherence assessment
  • E.g., the patient either has, or has not, had an injection, and collecting these data are just part of the routine administration of long-acting medication
  • E.g., charting injection administration is a routine clinic requirement

• The Care Transitions Network (CTN) has developed a long-acting injectables (LAI) toolkit that is available as an online program at the Center for Practice Innovations website

• For oral medications, we have a range of assessment measures and priorities have to be determined
Some strategies to consider

• CTN sites have access to Medicaid pharmacy claims data
• These data can often easily identify patients who are at very high risk of being totally or substantially non-adherent
• Follow-up discussion will often confirm the findings
• If questions remain (e.g., a patient continues to claim to be adherent despite not filling prescriptions), one of the direct methods (e.g., blood levels) can clarify adherence status
Some strategies to consider

• For the remaining patients, the direct adherence measures provide better data, but their costs/staff burden often preclude their use for widespread use
  • Adherence needs to be continually monitored as adherence often varies within individuals over time
Some strategies to consider

• One of the indirect methods or a combination of indirect methods is usually more feasible for long-term longitudinal use for a broad group of patients

• These can be supplemented with direct methods for selected patients
  • Which indirect method is best depends upon the clinic
    • E.g., large clinics with specialty services may use self-report measures specific to each specialty disease, whereas smaller clinics may use self-report measures that are not disease-specific
Summary

• We have a variety of available adherence assessment measures
• Choice of measures used should be tailored to the needs of the clinic and patient population served
• Whatever measure is used, adherence assessment should be done with all patients on a longitudinal basis as adherence often fluctuates within an individual
• Our current methods are likely to be expanded by technological advances over the coming years
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