Guidelines that May Change Your Practice

Testing for Drugs of Abuse in Children and Adolescents

Lorena M. Siqueira, MD, MSPH

Director, Adolescent Medicine Division
Director, Adolescent Medicine Fellowship Program
Miami Children’s Hospital
Miami, Florida
Disclosure of Relevant Relationship

- Dr. Siqueira (or spouse/partner) has not had (in the past 12 months) any conflicts of interest to resolve or relevant financial relationship with the manufacturers of products or services that will be discussed in this CME activity or in his presentation.

- Dr. Siqueira will support this presentation and clinical recommendations with the “best available evidence” from medical literature.

- Dr. Siqueira does not intend to discuss an unapproved/investigative use of a commercial product/device in this presentation.
TESTING FOR DRUGS OF ABUSE IN CHILDREN AND ADOLESCENTS

Lorena M Siqueira MD MSPH
Dir. Adolescent Medicine
Miami Children’s Hospital
Drug testing is often used as part of an assessment for substance use in children and adolescents.

The term “drug testing,” itself, is misleading, because it implies that all substances will be identified by testing.
OBJECTIVES

1. Recognize the need for confidentiality

2. Recall the types of matrices (specimens)

3. Discuss the shortcomings of testing
Many national organizations, including the AAP, have consistently cautioned against involuntary drug testing in adolescents.

Drug testing of a competent adolescent without his or her consent is, at best, impractical and without his or her knowledge is unethical and illegal.

Adolescents younger than 18 years are able to consent to substance use treatment without parental consent in more than half of the United States.
CONFIDENTIALITY

- Adults who have a long-term relationship with an adolescent are often aware of early behavioral, mental health, and physical changes that may prompt the request for drug testing.

- Prior to drug testing, the pediatrician should get a detailed description of the concerns to formulate a differential diagnosis and determine whether a drug test may be a helpful part of an assessment.

- If so, a discussion about:
  - the limited scope of information available from testing
  - need to reach a consensus on an action plan for both positive and negative results before you do a test

- This will make any intervention easier to implement.
CONFIDENTIALITY

• Discuss with the adolescent, the concerns raised by the adult and the request for a drug test

• Assent, including written permission to share results, should be obtained before testing

• If an adolescent refuses to consent to sharing the drug test results with a parent then they should not be shared

• If the drug test was requested by the parents, explain to them that their son or daughter has not consented to release drug test results

• However, as in all situations, if an adolescent’s behavior puts him/her at acute risk of harm to self or others, the pediatrician should consider breaching confidentiality.
SPECIMEN TYPES (MATRICES)

- Urine
- Breath
- Blood
- Saliva
- Sweat
- Hair
- Neonates may also be tested using meconium
**INTERPRETATION REQUIREMENTS**

- Individual’s complete medical history, including prescribed medications
- Limitations of the selected matrix
- Substances for which the drug panel tests
- Potential cross-reactivity
- Should not hesitate to ask for assistance in ordering the correct test or interpreting results
URINE TESTING

- Most common matrix used in primary care
- Well standardized and studied
- For some substances provides a longer window of detection
- Less invasive than blood testing

BUT

- Invasive and highly susceptible to tampering
URINE SPECIMEN COLLECTION

- Direct observation - most reliable method for specimen collection
- Less-invasive collection method (no direct observation)
- The procedure should be explained to the patient before any collection
- Excluding coats and bags
- Using a specially prepared restroom without running water, soap, or other chemicals
- Toilet water should be tinted
URINE SPECIMEN

- Specimen’s appearance and color should be documented
- Temperature taken within 4 minutes, preferably by use of a collection container with a temperature-sensitive strip on the outside
- Temperature should range from 90°F to 100°F (32°–38°C)
- A national survey of physician practices found that most offices use none of these procedures (although many provide a staff member outside the door to listen for running water)
Container for urine sample
Two types of drug testing assays are available:

- **Qualitative** tests usually used for screening
- **Quantitative** tests used for confirmation

**Qualitative:**
- point-of-care tests and home drug test kits
- Easy to perform and relatively inexpensive
- Utilize immunoassays, such as enzyme-linked immunoassay (ELISA) or radioimmunoassay (RIA), that give instant positive or negative results

- Although they are very sensitive and function well as screening tests, they are susceptible to cross-reactions resulting in false positive results, which limit their specificity.
Confirmatory tests - performed in laboratories and not at the point of care

Most laboratories use a combination of gas chromatography and mass spectrometry (GC/MS) and can positively identify a substance and generate quantitative concentrations

2-steps: Some laboratories use qualitative tests as a “screening procedure”; negative test results are discarded and only positive test results are run through more expensive confirmatory testing

This 2-step procedure has become less common as the cost of confirmatory testing has decreased
SOURCES OF ERROR IN INTERPRETING URINE DRUG TESTS

• False positive

• False negative

• True positive urine test does not give information about the drug use pattern, or the presence of dependence

• Similarly, a negative test does not indicate that the patient has not used drugs
FALSE POSITIVE RESULTS

• “Clinical” false-positive: detection in the absence of illicit drug use

• More likely to occur on a screening test because of cross-reactivity with an unrelated substance in the urine

• Confirmatory tests are highly unlikely to yield false-positive results

• When a patient takes a certain prescription medication or ingests a food that metabolizes into a substance included in the drug testing panel

• Cannot distinguish between appropriate use and misuse of prescribed medications
False-Negative Results

- A negative drug test result does not necessarily mean that an adolescent is not using a particular substance.

- Use may escape detection because of the timing of use relative to the testing.

- If the cutoff concentration for a positive test result is set too high, small amounts of drug or metabolite may be missed.

- The urine specimen submitted may not be a valid sample:
  - submitting someone else’s urine
  - dilutes his or her own urine
  - add an adulterating (or “masking”) agent to the sample to interfere with the screening immunoassay (e.g., soap, bleach, ammonia)
False-Negative Results

• Psychoactive substance used is not part of the standard test panel resulting in a “clinical false-negative” test result (e.g., “spice” and newer designer drugs)

• Test panels often use a common metabolite to identify an entire class of substances

• However, individual substances with variant metabolism can still be missed
  • Benzodiazepine panels that identify oxazepam will not identify clonazepam, which is commonly misused by adolescents but not metabolized through this pathway
Dilute Specimens

- Creatinine, a product of muscle metabolism, used as a marker of urine concentration and should be ordered with each sample.
- A dilute specimen has a random creatinine concentration between 2 and 20 mg/Ml.
- Smaller adolescents or those with less muscle mass are more likely to have lower random urine creatinine concentrations.
- Adolescents may consume a large volume of fluid before the test either spuriously, to be able to produce a urine specimen rapidly, or intentionally to attempt to defeat the test.
A dilute sample may be positive for one or more substances and should be considered both positive and dilute.

It is possible to miss substances present in lower concentrations (e.g., a urine specimen may test positive for marijuana but be too dilute to identify low levels of cocaine).

A repeat drug test first-morning specimens generally result in samples with adequate concentration.

If a first-morning specimen is not possible, the adolescent can limit fluid intake in the few hours before providing a specimen.
Substituted & Adulterated Specimens

- **Substituted** specimens may be cold
- May be found in the adolescent’s possessions

- **Adulterated** specimens may have an unusual color or smell
- May have out-of-range pH
- May result in a positive “adulterant panel” (available from some commercial laboratories)
- May have a urine creatinine concentration ≤2 mg/mL
Inadequate Specimens

- Urine specimens that have been substituted or adulterated in vitro should always be considered “positive”

- May represent a serious substance use disorder and/or co-occurring mental health or behavioral disorder

- Referral to an addiction specialist or mental health expert is warranted
Negative Test Results

- Repeat drug testing may be of value
- Change the method (e.g., to laboratory testing if a point-of-care test was used)
- Changing/adding to the test panel
- Add specimen validity testing

- A test result that is negative despite ongoing drug use might inadvertently delay detection and treatment of a substance use disorder if symptoms are dismissed and further evaluation is not pursued
Positive Test Results

• Always review positive results first with the adolescent

• May begin the interaction by informing the adolescent that the drug test gave unexpected results (which could refer to a test interpreted by the physician as positive, dilute, or adulterated) and asking for more information

• In some instances, the adolescent may report substances not detected on the panel, ultimately yielding more information than the test results alone conveyed

• Determine whether something other than substance misuse may explain the observed results
Positive Test Results

- Should consider both the laboratory results and the history before assessing the likelihood of substance use and presenting information back to parents.

- If the adolescent’s report matches the drug test results can begin a conversation about the next steps.

- May include an abstinence trial, ongoing testing, and/or a referral to counseling or other treatment.
HOME DRUG TESTING

• Have been commercially available and marketed to parents to prevent adolescent drug use for the past 15 years

• Marketing Web sites often include “home drug testing policies” that recommend drug testing on either a routine basis to prevent drug use or when a parent has specific concerns

• To date, the efficacy of home drug testing for reducing substance use by adolescents has not been rigorously tested
HOME DRUG TESTING

• Been endorsed by several school districts and police departments around the country

• The AAP does not endorse home drug testing
  • concerns about the complexity of testing
  • significant potential for parents to misinterpret test results
  • limited evidence that home drug testing reduces drug use
  • theoretical concerns about a negative effect on the relationship between parents and their children

• A professional evaluation should be considered whenever a parent has concerns about substance use.
• Drug testing should never be the sole basis for making a diagnosis of a substance use disorder

• Rather, test results should be used to supplement information obtained by history and physical examination

• Signs and symptoms of a mental health, behavioral, or substance use disorder should not be dismissed solely on the basis of a negative drug test result or inability to obtain a test

• These symptoms always require further evaluation
  • referral to a specialist should be considered
Changes You May Wish to Make in Practice

- Discuss confidentiality at a first visit with the patient and parents
  - Know the laws of your state and the limits to confidentiality
  - Billing policies, medical records, and appointment notification can compromise confidentiality
  - All clinic staff should understand policies about confidentiality and consent

- When screening adolescents for risk-taking behaviors interview them without a parent present
- Good outcomes are more likely if you review how test results will be managed before a test is sent to the laboratory
- Consider creating a protocol for specimen collection
References
