



**Case Report**

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# The Case for Drug Testing in Pediatric and Adolescent Medicine: Revisiting Brer Rabbit and the Tar Baby



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## Case Report

In the classic folk tale Brer Rabbit and the Tar Baby, the second title of the Uncle Remus collection of stories from the late 1800's, Brer Fox devises a plan to trap Brer Rabbit [1]. The fox positions a doll made of tar and turpentine on the road to goad the rabbit who becomes increasingly agitated when he speaks to the tar baby with no response. Brer Rabbit considers the Tar Baby's lack of response so rude that he, ironically, begins physically attacking the Tar Baby to elicit a response. The result is a rabbit stuck deeper in tar with each strike and now at the mercy of Brer Fox.

Drug testing often imposes a similar quagmire of frustration when the laboratory yields curious results for the management of an adult or child patient. Oftentimes such a result elicits the need to "do something" to effectively manage the patient which can include performing more lab or radiologic tests, soliciting specialist consultation or other reactive as well as proactive actions. These actions can be implemented as much for patient management as for protection of the physician and his/her practice. The pediatric or adolescent patient is further unique in that he/she is often seen as a triumvirate of mother, father and child. Such an interaction requires a different type of sensitivity in addition to knowledge of both state specific confidentiality laws and interviewing skills specific to this age group and the subject of drug use and drug testing in this population as part of the medical evaluation. It is often the default position of the parent to wince at the mention of asking his/her child to submit for non-invasive (oral swab, urine) drug testing. Many parents may find it incredulous to suggest such as it posits that their child may be engendering in illicit or inappropriate behavior of some sort. This gestalt is further delineated from adult medicine in that a positive

drug test in a child may cast aspersions on their efficacy as a parent, making communication regarding this topic even more fraught with difficulty [2].

In addition to the parental perspective, there is also the positioning of the pediatric or adolescent patient. Schwartz and colleagues assessed the perspectives of parents and adolescents regarding the ability to perform involuntary testing for drugs of abuse [3]. They queried parents and adolescents separately on whether parents have the right to ask a teenager's physician to order a urine test for drugs of abuse without their knowledge in the setting of falling grades, uncooperative attitude and/or major untruthfulness without consent. The majority of the parents (>80%) approved of non-consented drug testing by the physician whereas only about half (~54%) of the teenagers agreed with this approach. In contrast, more teenagers (>30%) stated that parents have no such rights compared with parents (~11%). Although the American Association of Pediatrics cautions against involuntary drug testing in a competent adolescent without his or her knowledge as well as maintaining their confidentiality by not sharing the results with their parents, there are situations (i.e. acute risk of harm to self or others) when the pediatrician is mandated to breach this confidentiality [4]. In general, maintaining trust and communication of the dyad (patient/parent as well as patient/physician) and triad (patient/parent/physician) towards fostering a long term relationship and appropriate clinical management remains the ideal but can be difficult at times.

Nonetheless, due to the present opioid epidemic the need for drug testing in the pediatric population has increased dramatically. The ease of access to prescribed as well as illicit

drugs are ever increasing [5]. Part of this is due to the increased prescribing of narcotic analgesics over the past 10 years, many of which remain stored in an accessible medicine cabinet years after the prescription is filled. Part of this is also due to social media connectivity opportunities through chat groups, non-pharmaceutical grade privately produced by street chemist and the like offering unparalleled accessibility compared with pre internet drug trafficking.

Children and adolescents can intentionally access narcotics by visiting grandma's medicine cabinet or night table as well as the school yard, neighborhood contacts or internet [6]. In addition, unintentional ingestion of other substances is also of concern. Many supplements, herbs and other natural remedies which may be provided by parents to children for good reason may be tainted with other agents such as benzodiazepines or amphetamines causing various clinical sequelae [7]. This may be further augmented by other medications prescribed to the child causing differential metabolism of parent / metabolite agents as a result of CYP enzyme inducer and inhibitor relationships as a result of the ingested drugs.

According to the CDC, children >12 years have a prevalence of illicit drug use of 10.1% and nonmedical use of a psychotherapeutic drugs of 2.4% over a given month's span [8]. Age based analysis shows that illicit drug use is highest 16-17 year old age group (16.3%) compared with those who are younger (14-15 year - 7.2% and 12-13 year - 2.6%). Marijuana use has increased aggregately over the last decade by 34% (6.2% in 2002; 8.3% in 2015) with similar patterns among races with the greatest use in 16-17 year old children (~15%) compared with younger children (14-15 years ~5%; 12-13 years ~1%) with no major differences in gender [8].

Furthermore, although, select substance use including alcohol, cigarettes, marijuana, cocaine, inhalants, and MDMA (Ecstasy) have decreased over the past three decades among all races, age groups and genders, they are maintained with some variability; i.e. ~35% alcohol ingestion among 12th graders compared with ~10% of 8th graders [8]. Thus, drug use and abuse is ever present in the pediatric and adolescent population and to this end, clinical laboratory toxicology testing can provide objective ancillary support for effective patient management if employed in the proper context.

It is important to understand the limitations of laboratory drug testing as much as the advantages of drug detection. Differentiating between a drug "screen" and "confirmation" is critical. A screen often uses immunoassay (IA) technology where the detection antibody utilized recognizes a class of drugs (i.e. opiates) rather than individual drugs in that class (codeine, morphine, hydrocodone, etc). Confirmatory testing utilizes gas or liquid chromatography along with mass spectroscopy (GC/MS or LC/MS, respectively) to identify a molecular fingerprint of each individual drug often referred to as a "mass to charge"

ratio. Screening assays are often found in the doctor's office and have a faster turnaround time to result than confirmatory testing therefore increasing its appeal and presence in the laboratory testing algorithm.

However, immunoassays can cross react with other molecules yielding a false positive. For example, over the counter cold medicines containing pseudoephedrine can 'screen' positive for amphetamine on immunoassay but 'confirm' negative by LC/MS. Screening assays also often have a higher limit of detection compared with confirmatory testing. Thus, a sample which contains 89ng/mL of cocaine may 'screen' negative by IA if the lower limit of detection (LOD) is 200 ng/mL but 'confirm' positive by LC/MS with an LOD of 50 ng/mL. Furthermore, the time of drug ingestion, frequency of use and type of specimen (urine, oral swab, blood, hair) all have different relationships with the biodistribution of a given drug and can affect results [9].

In either technology, detection of an analyte also depends on the presence of internal controls to validate what is being detected. Certain laboratories will test for different drugs of abuse compared with other laboratories. Such differences in test menu offerings are often due to clinical clientele, economics, and implementation logic. In addition, the ever present new street drug may not yet be detectable when the testing methods to detect them are not validated and/or available. Such examples include the Gray Death and Zombie drugs where labs have to keep in step with the street chemists [10,11]. Furthermore, sometimes validation of a new assay presents a health hazard to the clinical laboratory. The recent wave of carfentanil deaths were only assayed by certain labs (i.e. medical examiners) since incorporating method validation of carfentanil, a drug 100x more potent than fentanyl normally used to tranquilize elephants and rhinoceros, put laboratory staff at risk during specimen processing by experiencing a microcosm of the drug's effects when airborne.

Home detection kits pose additional issues since these types of tests are often employed by a concerned parent or school where any result is not tempered with understanding of testing methodologies, interfering factors, limitations, or the clinical picture surrounding the plausibility of drug abuse (i.e. signs and symptoms, psychosocial environment) and the like. It is important to understand that general routine laboratory drug testing results are not legally binding towards expulsion, incarceration, or reprimand. Only accredited labs that adhere to Substance Abuse and Mental Health Services Administration (SAMHSA) guidelines which include chain of custody of the procured patient sample (i.e. forensic laboratories) can provide results that can be used in a legal context [12]. In addition, variation of which pediatric or adolescent population are considered at risk, and should therefore be tested, vary among different societies and institutions (i.e. student athletes vs musicians). In certain studies, there were no apparent differences in self-reported drug use compared with tested drug use in students [13] casting doubt regarding the benefit of general drug testing in schools, without a clear

understanding of who to test, when to test, how to test, and what to do with test results.

Any laboratory test should only be performed if the results will affect management in some manner. Drug testing in children in particular should never be overcast as a punitive measure and should only be performed if there is a system in place to address drug abuse [14]. Many communities lack appropriate counseling/support/detox services to treat children and adolescents with substance abuse disorders. Thus, clinical laboratory toxicology testing serves to provide objective ancillary support to the pediatrician in conjunction with other objective and subjective findings during examination of the patient to aid in diagnosis and management. Drug testing on children and teenagers should only be considered in the context of an existing bona fide support infrastructure, where care and management of addiction can be implemented. Anything less would be hitting the tar baby yet again.

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