Helping Clinicians
Make Better Decisions

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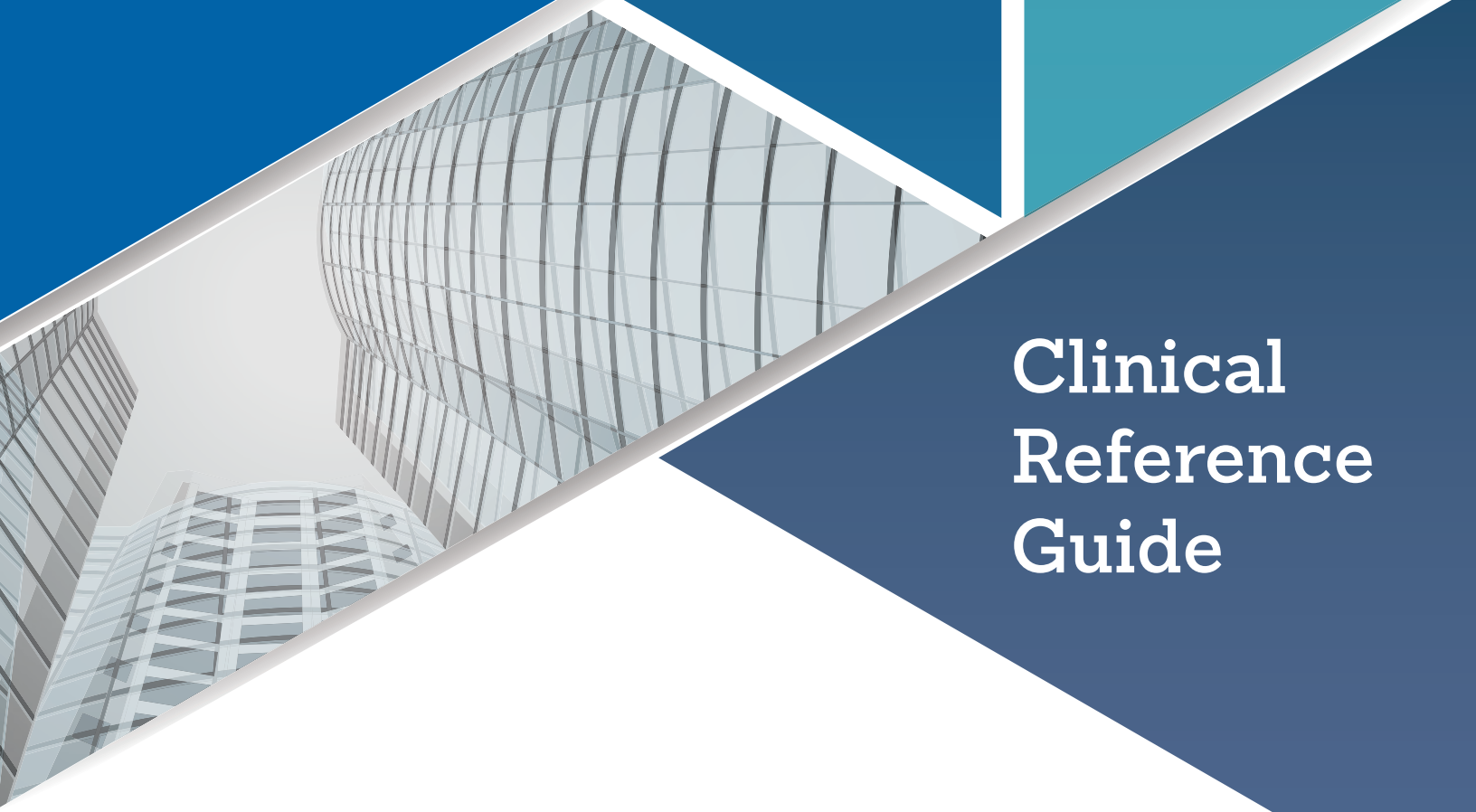

Clinical Reference Guide

Glossary of Terms

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Glossary of Terms

Adherence Drug Testing - Drug testing employed to assess consistency between patient's drug test results and their prescribed medications. Adherence testing may be used to indicate the presence of prescribed or nonprescribed drugs, but cannot be used to assess adherence to all parameters of a prescription such as dosage or frequency.

Analyte - Any specific substance included in drug testing, such as a parent drug or a metabolite.

Chromatographic Resolution - The distance between two peaks; it is based upon differences in compound retention times. Greater distance between peaks indicates higher resolution.

Chromatography (gas or liquid) - Designed to separate compounds by a partitioning process to allow for identification of unique drugs and metabolites by a detector.

Cross-Reactivity - The extent to which an analyte (i.e. drug, metabolite, or other known substance) binds with an immunoassay antibody that was targeted to a different analyte. If a drug has a similar structure to the target analyte, then the antibody may bind and trigger a positive result. Notably, some drugs with no clear structural similarity to the target may still bind to the antibody. The extent of cross-reactivity across drugs in a class (or to other cross-reacting compounds) may vary depending on the immunoassay used. Cross-reacting compounds may result in false positives. Lack of cross-reactivity across a class may result in false negatives.

Cytochrome P450 Enzymes (CYP Enzymes) - Enzymes present in the liver, small intestine, brain, lungs, kidney, etc. that play a large role in drug metabolism. Patients will exhibit significant differences in function of cytochrome P450 enzymes secondary to genetic differences, age, diet, drug-drug interactions, etc.

Definitive Testing - Testing method that rules out the concerns of false positives and cross-reactivity that are associated with immunoassay methods. Examples of definitive methods include gas chromatography/mass spectrometry (GC/ MS) and liquid chromatography/tandem mass spectrometry (LC/MS/MS), among others.

Ethyl Glucuronide (EtG) - Specific marker of alcohol ingestion. Aegis offers a test for EtG in urine which indicates ingestion of alcohol within the past 72 hours. It is important to note in some circumstances, EtG may form as a result of post-collection fermentation when glucose, yeast, and bacteria are present in the specimen.

Ethyl Sulfate (EtS) - Specific marker of alcohol ingestion. Aegis offers a test for EtS in urine which indicates ingestion of alcohol within the past 72 hours. The presence of EtS is less likely to be a result of post-collection fermentation than EtG.

False Negative - Negative result that is concluded in error.

False Positive - Positive result that is concluded in error.

Gas Chromatography/Mass Spectrometry (GC/MS) - Gas chromatography coupled with mass spectrometry methods (please refer to chromatography and mass spectrometry).

Genetic Polymorphism - A known difference in DNA sequence among individuals, groups, or populations.

Genotype - The genetic composition or genetic code.

Glucuronidation - Phase II metabolism pathway. Glucuronic acid becomes conjugated to a medication or toxin. Glucuronidation generally results in less toxic substances that tend to be more readily excreted.

Immunoassay - Testing methodology based upon the principle of competitive binding (antibody, antigen, and labeled target). Immunoassay technology is utilized as a presumptive method and provides qualitative (negative or non-negative) drug test results; it is also associated with concerns such as false positives, false negatives, and cross-reactivity. Immunoassay technology may be utilized in point-of-care cups, tabletop analyzers, and laboratory methods.

Incidental Exposure - Unintentional or accidental exposure to a specific substance, medication, or illicit drug secondary to occupational circumstances or societal/community exposure.

Interference (Chromatographic) - Substances such as proteins, bacteria, salts, or high concentrations of other drugs may cause a mass spectrometry method to fail to detect a particular analyte within acceptable qualitative criteria. Interfering substances may not be identifiable, and the risk of interferences may increase if the specimen is not stored properly before analysis. Interference may also occur secondary to decreased chromatographic resolution (which may be related to the particular mass spectrometry testing method used).

Intermediate Metabolizer (IM) - Drug metabolism is impaired.

Intrathecal Administration - Administration of medication into the spinal subarachnoid space.

Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) - Liquid chromatography coupled with tandem (i.e. back-to-back) spectrometers (please refer to chromatography and mass spectrometry).

Mass Spectrometry - Method by which drugs and metabolites are identified by their unique chemical composition, ion ratios, and molecular mass.

Metabolite - Specific products of drug metabolism. Metabolites vary according to the parent drug being ingested and metabolized. The presence of metabolites in a specimen is indicative of medication ingestion.

Methamphetamine *d*- and *l*-Isomer Testing - Isomeric analysis for methamphetamine may be conducted which will help provide information as to which isomer, *d*- or *l*-, is predominantly present in a given specimen.

Minor Metabolism - Certain medications have primary metabolism pathways and minor metabolism pathways. Minor metabolism pathways comprise a smaller proportion of metabolism for the drug. Minor metabolism pathways may be inconsistently observed both from interpatient and intrapatient perspectives.

Normetabolites - Term referring to drug-specific metabolites such as norcodeine, noroxycodone, norhydrocodone, norfentanyl, etc. Normetabolites are usually products of cytochrome P450 3A4 metabolism and most possess minimal opioid activity.

Opiates - Drugs that target the opioid receptors and are found naturally in opium (i.e. codeine and morphine). The term opiates also includes semi-synthetic drugs such as hydrocodone, oxycodone, hydromorphone, and oxymorphone which are structurally related to codeine and morphine.

Opioids - Drugs that target the opioid receptors. The term includes opiates and synthetic opioids such as methadone, fentanyl, meperidine, levorphanol, buprenorphine, and tramadol.

Parent Drug - Refers to the drug that was ingested. Parent drugs are further metabolized to metabolites. Specimens may be tested for parent drugs and/or specific metabolites.

Passive Exposure - Exposure not related to active use or inhalation by a particular individual. Examples of passive exposure would include secondhand smoke from marijuana or cigarettes that affects individuals other than those actively using the drug.

Period of Detection - Estimated time period in which a drug can be detected after use.

P-Glycoprotein - Efflux transporter involved in decreasing gastrointestinal absorption of a drug and/or passage of a drug through the blood brain barrier.

Pharmaceutical Impurity - Process impurities that may be present in a drug formulation up to a certain allowable percentage by drug manufacturers.

Pharmacodynamics - The study of the relationship between drug concentration at the site of action and the effects. May generally be referred to as the effects a drug has on the body.

Pharmacogenetics - A subset of pharmacogenomics which generally involves the study of 1-2 genes for variation in drug response.

Pharmacokinetics - The study of drug absorption, distribution, metabolism, and excretion. May generally be referred to as the effects the body has on the drug.

Phenotype - The physical manifestation of a genetic code.

Point-of-Care Tests - May include dipcards, cups, oral fluid devices, or tabletop analyzers used at the “point-of-care” (e.g. physician’s office). Point-of-care tests are based upon immunoassay technology.

Polymorphism - Variations in DNA sequence that occur in greater than 1% of the population.

Poor Metabolism (PM) - Drug metabolism is significantly impaired or completely lacking.

Presumptive Positive - Due to extensive risk of cross-reactivity, positive immunoassay results are called “presumptive positives” until further tested by GC/MS or LC/MS/MS testing.

Proficiency Testing - Comparative testing between laboratories that serves as a quality assurance tool. Proficiency testing participation is required by some accrediting organizations that mandate laboratories undergo testing for analyses completed in the laboratory.

Qualitative Results - Qualitative testing yields a “yes or no” answer (i.e., is the drug detectable or not). Immunoassay results are qualitative, even when a number is provided by a testing instrument.

Quantitative Results - In the context of pain management drug testing, quantitative refers to specific concentrations that are reported for drugs and their metabolites.

Reporting Threshold - Predetermined concentration at which an analyte (parent drug or metabolite) will be reported as positive. The analyte must be present at or above the reporting threshold to be considered positive. Reporting thresholds vary depending on the drug or metabolite, the specimen type, and the testing method used. Threshold selection must also take into account interpretive considerations such as incidental or passive exposure.

Semi-Quantitative Results - In the context of pain management, semi-quantitative results may be obtained from in-office tabletop analyzers and are displayed as concentrations. However, the concentration should be considered an estimate, unlike quantitative results. Semi-quantitative results are still regarded as qualitative results in the field of toxicology testing.

Sensitivity - A measure of a test's ability to detect a particular drug. A test with increased sensitivity would be able to detect a drug at a lower concentration compared to one with decreased sensitivity.

Specificity - A measure of how selective a test is for a particular drug.

Stereoisomers - Compounds that have the same structure but different spatial arrangements. Stereoisomers which are mirror images of one another are called enantiomers.

Synthetic Cannabinoids - Other terms for synthetic cannabinoids include "Spice" and "K2." Synthetic cannabinoids are substances of abuse that produce similar pharmacological effects as marijuana and may be sold under the guise of household aromatics, fragrances, or incense.

Turn-Around-Time - Amount of time it takes for a sample to be analyzed and results to be reported. The time frame begins when a specimen is received by a particular laboratory.