

Drugs of Abuse Screening (Lecture Notes)

20/01/14

Drugs of Abuse Screening

Intoxicated patients in A&E and poisons unit (part of the differential diagnosis)

Drug addiction centres (screen for drug use, check compliance)

GP patients with drug/alcohol addiction issues (screen for drug use, check compliance)

Babies born to mothers with drug / alcohol addiction

What is commonly screened for

Amfetamines, Benzodiazepines, Cannabinoids, Cocaine, Opiates, Methadone, Buprenorphine, Barbiturates

Screening strategy

Routinely 2 step approach : Initial **screening** by automated immunoassay to filter out negative results (cheap, rapid results, minimal sample preparation BUT prone to interferences, limited information e.g. opiate positive but no information about which opiates are present). **Confirmation** of positives by more specific methods e.g. GC, GC-MS, LC-MS (specific, additional information BUT expensive, sample preparation, solvents/chemicals used, expertise required to run methods, maintenance of analysers, interpretation of results, samples run in batches)

Positive results need to be produced by 2 different methods to be legally defensible (stand in court)

Currently at SWBH Toxicology Lab: Both screening and confirmation by LC-MS/MS. Only cannabinoids and pH by immunoassay.

Matrices routinely used for screening:

Urine: Preferred matrix, Drugs and metabolites rapidly excreted in urine, Non-invasive sample collection, large volumes available, 2-3 days detection window depending on frequency of use, quantity, individual metabolism

Saliva / Oral fluid: Ultrafiltrate of blood, small volumes, non-invasive sample collection, easily witnessed, 1-2 days detection window, mainly parent drugs

Blood: Invasive sample collection, small volumes, 1-2 days detection window

Hair: Rarely used for clinical screening, weeks/months/years detection window

Gastric contents / Liver tissue: Mainly for forensic screening / post-mortem screening

Chain of Custody:

Very important! In place to provide an audit trail from sample collection all the way to result reporting. Usually 3 copies (one for lab, one for client, one for collector).

Sample collection is witnessed, sample is split into 'A' and 'B' – both sealed with security seals and sent to the lab. Only sample 'A' analysed – Sample 'B' is kept in case the results are challenged by client in which case sample 'B' will be sent to an independent laboratory for analysis.

Both client and collector need to sign the chain of custody form.

Sample integrity

Urine creatinine: is specimen urine? <1.8mmol/L (dilute), 0mmol/L (NOT urine!)

Urine pH: Should be between 4 and 9