Information for Users of the Toxicology Service, Table of Contents

1 Drug Use: Aims and Treatment

The QEUH Toxicology Laboratory provides a clinical toxicology service to support the management of drug use and dependence. The service is designed to be consistent with the aims and therapeutic options employed in drug use investigations and treatments.

The treatment aims in drug use and the criteria of success depend on several factors: the individual patient and their social circumstances; drug involved and whether it produces dependency; whether the user is dependent on it; methods of drug administration. Some of the therapeutic and social aims in treating patients who are injecting addictive drugs are:

- **Reduction of infection risk for patient and reduction in the incidence blood-borne virus infections**
- **Specific improvement in health of people using drugs**
- **Elimination of criminality associated with drug dependency**
- **A reduction in the prevalence of drug use by treatment and education**

Full discussion of the treatment options is beyond the scope of this document. Please refer to Drug misuse and dependence: UK guidelines on clinical management[1] and Medication Assisted Treatment Standards for Scotland[2].

2 Urine Sample Collection

It is not uncommon for patients to attempt to avoid detection of drug use or non-compliance of prescribed medications by substitution with another person's urine, or deliberate adulteration of their urine sample with prescribed drugs (e.g. methadone), water or toilet disinfectants and bleaches. If supervision of the passing of urine is unacceptable, patients should ideally pass urine in a room where there is no water supply or source of adulterants. Failing this, if the toilet cubicle does not contain a wash-hand basin, a proprietary disinfectant (e.g. "Blue Flush") may be used in the cistern so that attempted adulteration is immediately apparent. **It is the responsibility of the requesting location to determine the appropriate level of supervision for their patients during sample collection.** Please also refer to section 4.3 on sample integrity testing.

[1] Drug misuse and dependence: UK guidelines on clinical management 2017
[2] Medication Assisted Treatment Standards for Scotland 2021

3 Laboratory requests

Answers to the following questions are useful to us:

- *What is the nature of the suspected drug use?*
  In order that we perform the appropriate investigations it is useful for us to know the patient's history. For example not all patients are using drugs by injection. Requests to the Laboratory may be part of the investigation of overdose, psychosis, depression or altered behaviour.

- *Is the urine sample from a patient undergoing initial assessment?*

- *What medications are being prescribed and at what dosages? What over the counter medications, if any, has the patient taken in the last week?*
  Please provide details of prescribed and other medications, particularly those that are detected in the drug screen e.g. methadone, buprenorphine, diazepam etc.

- *Level of supervision employed?*
  It is useful to know if the administration of a prescribed medication is being supervised, for example methadone by the pharmacist, and if urine specimen collection was supervised.

- *Has point of care testing (POCT) been performed prior to Laboratory testing?*
  If POCT (dipstick, lateral flow devices) has been performed, please provide details on the paper request form or in the clinical details field of electronic requests e.g. 'Sample positive for benzodiazepines on POCT' etc.

4 Drug Information including interpretation of report

4.1 Urinary Drug Analysis using LC-MS/MS (Tandem Mass Spectrometry)

In the Toxicology section of the QEUH Clinical Biochemistry laboratory all urine samples are routinely screened for a panel of 48 drugs and drug metabolites simultaneously using LC-MS/MS technology (Liquid Chromatography with Tandem Mass Spectrometry).

This technique has replaced previous testing protocols which used an initial screening immunoassay test for groups of drugs (amphetamines, benzodiazepines, cannabis, opiates, methadone, buprenorphine) followed by confirmatory testing by GC-MS or LC-MS/MS. See table below for the drugs and drug metabolites routinely tested for. The cut-offs used are detailed in each section but for a full list see table in Appendix 1: Drug cut-offs.

The following list of drugs are routinely tested for in all patient urine samples:

Drug/Drug Metabolite	
Amphetamines	***Opioids - synthetic***
Amphetamine	Oxycodone and metabolite (Noroxycodone)
Methamphetamine	Fentanyl and metabolite (Norfentanyl)
MDMA aka Ecstasy	Tramadol
Cocaine	***Gabapentinoids***
Cocaine metabolite (Benzoylecgonine)	Pregabalin
	Gabapentin
Benzodiazepines	
Diazepam and metabolite (Nordiazepam)	***Z-drugs***
Temazepam	Zopiclone
Oxazepam	
Chlordiazepoxide and metabolite (Demoxepam)	***Street Benzodiazepines***
Clonazepam and metabolite (7-aminoclonazepam)	Alprazolam and metabolite (Alpha-hydroxyalprazolam)
Lorazepam	Bromazolam
Nitrazepam and metabolite (7-aminonitrazepam)	Diclazepam and metabolite (Delorazepam)
	Etizolam and metabolite (Alpha-hydroxyetizolam)
Cannabis	Flualprazolam
Cannabis metabolites (11-nor-9-Carboxy-Δ^9-THC and 11-nor-9-Carboxy-Δ^9- THC glucuronide)	Phenazepam and metabolite (3-hydroxyphenazepam)
Opioid substitutes	***Dissociatives***
Buprenorphine and metabolite (Norbuprenorphine)	Ketamine
Methadone and metabolite (EDDP)	
Opiates	
6-MAM (6-monoacetylmorphine)	
Morphine	
Codeine	
Dihydrocodeine	

4.2 Limitations of LC-MS/MS testing and extended testing

The introduction of LC-MS/MS testing permits simultaneous testing of a wide panel of used drugs not previously available in the laboratory. This technique is more specific than immunoassay testing and does not routinely require confirmatory analysis.

Despite this, false positives and negatives are possible with LC-MS/MS screening. When required for patient management and/or results do not fit with clinical picture or patient history, urine samples can be confirmed in an external laboratory by an alternative method e.g. Time of Flight (TOF) analysis. The cost for additional external testing will have to be cross-charged to the requesting location as it is not covered by the Laboratory budget. Please contact the Duty Toxicologist if this is required.

4.3 Sample Integrity Testing

Creatinine analysis is performed on every sample **in advance** of LC-MS/MS screening as a marker of sample integrity and concentration.

Creatinine is a metabolic by-product of muscle metabolism, excreted in urine in relatively constant quantities with "normal" fluid intake. Increased intake of water before sample collection or deliberate addition of water/liquid adulterants to a sample after collection, lowers the creatinine concentration and also dilutes the concentration of any drugs in the sample.

Comments are added to Creatinine results as follows:

Reports:

Urine Creatinine Result	Report comment
0.6 to 1.8 mmol/L	**Dilute urine. Beware of false negative results.**
0.3 to 0.5 mmol/L	**Very dilute urine. ? Adulteration by dilution.**
< 0.3 mmol/L	**Undetectable creatinine suggests this is not a urine sample or one that has been adulterated by dilution.**

Note that all urines with an undetectable creatinine result (i.e. <0.3 mmol/L) will be rejected and an appropriate comment added to the report. This avoids issuing False Negative drug results and reduces the risk of contaminating the analyser with adulterants which may have been added to a sample.

4.4 Amphetamines

Although amphetamines can be used by injection, oral ingestion is more common particularly with the methylenedioxy derivatives. These drugs produce little dependency but, with regular use tolerance develops and larger and larger doses are required for effect. Possible clinical presentations are: collapse, dehydration and hyperthermia; acute psychosis due to prolonged use and increasing doses; depression, following withdrawal after long-term use.

The 3 drugs which are detected in this category are **Amphetamine**, **Methamphetamine** and **MethyleneDioxyMethAmphetamine** (aka **MDMA, Ecstasy, E**)

Reports:

Urine Result	Reported
If all **amphetamine** results are less than **200 µg/L**	**Urine Amphetamines** is reported as **Negative**
If any of the **amphetamine** results are greater than or equal to **200 µg/L**	**Urine Amphetamines** is reported as **Positive**. All drugs detected are also reported individually e.g. **Amphetamine/Methamphetamine/MDMA** detected

4.5 Cocaine Testing

Use of cocaine in the UK is now widespread. Cocaine is a powerful CNS stimulant which produces exhilaration, feelings of superiority and confidence, suppression of appetite, and strong psychological dependence. In addition, it has a very limited duration of effect which leads to more frequent use. It is also smoked in the freebase form (crack).

Cocaine is detected as the urinary metabolite **Benzoylecgonine** (cocaine metabolite).

Reports:

Urine Result	Reported
If the **Benzoylecgonine** result is less than 100 µg/L	**Urine Cocaine** is reported as Negative
If the **Benzoylecgonine** result is greater than or equal to 100 µg/L	**Urine Cocaine** is reported as Positive.

4.6 Cannabis testing

The use of cannabis is widespread. Although cannabis is less harmful than other drugs, heavy use may be associated with psychosis and schizophrenia.

Our LC-MS/MS test detects the urinary **Δ9-THC metabolites 11-nor-Δ9-tetrahydrocannabinol-9-carboxylic acid** and **11-nor-Δ9-tetrahydrocannabinol-9-carboxylic acid glucuronide**.

Please note that this test does not detect Synthetic Cannabinoid (SCRA) drugs.

Reports:

Urine Result	Reported
If both **Δ9-THC metabolite** results are less than **15 µg/L**.	**Urine Cannabis** is reported as **Negative**
If either **Δ9-THC metabolite** results are greater than or equal to **15 µg/L**	**Urine Cannabis** is reported as **Positive**.

4.7 Benzodiazepines (Prescribable) Testing

Benzodiazepines are commonly used therapeutically, but may also be used harmfully by oral ingestion and injection. The prescribed benzodiazepines which are predominantly used in this way are diazepam and temazepam.

There are a large number of benzodiazepines and the metabolism of each is extensive, with little unchanged drug being found in urine.

The benzodiazepine test set ONLY includes: Diazepam, Temazepam, Oxazepam, Nitrazepam, Lorazepam, Clonazepam, and Chlordiazepoxide.

As several of these drugs metabolise to other benzodiazepines (e.g. diazepam metabolises to oxazepam & temazepam) these are reported as a Benzodiazepines group Positive or Negative. Details of the specific drug detected are recorded in the Laboratory computer system and can be discussed with the QEUH Duty Toxicologist if further interpretation is required.

Recently 'Novel Benzodiazepines' or 'Street Benzodiazepines' have gained popularity including Etizolam and Phenazepam. These are part of the **Street Benzodiazepines** set and are not reported as part of the prescribable Benzodiazepines set, see details later in document.

Reports:

Urine Result	Reported
If all **Benzodiazepine** results are less than **5 µg/L**	**Urine Benzodiazepine** is reported as **Negative**
If any of the **Benzodiazepine** results are greater than or equal to **5 µg/L**	**Urine Benzodiazepines** is reported as **Positive**. The following 4 drug or drug metabolites are also individually reported when detected e.g. **Clonazepam/Diazepam/Lorazepam/Nitrazepam detected**

4.8 Opiate Testing

Morphine and **Codeine** are derived from the opium poppy: **Heroin** (Diacetylmorphine) is produced from opium. These drugs produce relaxed detachment from pain, anxiety and desires and therefore produce contentment. There are two main reasons for treatment; firstly the hazard of injection, particularly the risk of blood-borne viral infection and secondly, the high street value and association with drug-related crime. **Dihydrocodeine** is a semi-synthetic opioid analgesic prescribed for pain or severe dyspnoea, or as an antitussive and can be prescribed alone or with paracetamol (as in co-dydramol).

The opiates test set **ONLY** includes **6-monoacetyl morphine (6-MAM)** (the urinary metabolite of Heroin), **Morphine, Codeine** and **Dihydrocodeine**.

Urine opiate confirmations/breakdowns using GC-MS are no longer routinely performed on Positive results.

Urine Result	Reported
If all **Opiates** results are less than **50 µg/L** (for **6-MAM** less than **10 µg/L)**	**Urine Opiates** is reported as **Negative**
If any of the **Opiates** results are greater than or equal to **50 µg/L** (for **6-MAM** greater than or equal to **10 µg/L)**	**Urine Opiates** is reported as **Positive**. All drugs detected are also reported individually e.g. **6-MAM/Morphine/Codeine/Dihydrocodeine detected**

4.9 Opioid substitutes

4.9.1 Methadone Testing

Methadone is commonly prescribed as an oral solution for medication assisted treatment to people using opiates such as heroin. Methadone can also be prescribed for analgesia or in palliative care either orally or by injection.

The methadone test set includes the parent drug **Methadone**, and the metabolite **EDDP** (2-ethylidene-1, 5-dimethyl-3, 3-diphenylpyrrolidine).

Previous testing strategies at QEUH involved an immunoassay screen that only detected the parent drug methadone and not EDDP. This approach led to instances where patients receiving methadone occasionally added methadone to their own or someone else's urine. This was an issue if sample supervision was not performed. Such behaviour will no longer result in apparent adherence due to the detection of the metabolite (EDDP) which detects methadone metabolism and hence adherence. In patients taking methadone daily, both methadone and EDDP are normally present. In certain circumstances (e.g. patients on low doses of methadone) only EDDP may be detected, however this is still consistent with compliance with methadone therapy. In cases where only methadone is detected or the Laboratory has reported an abnormally high methadone:EDDP ratio, this is consistent with addition of methadone to a urine sample.

Methadone preparations are typically green and spiking with large amounts of methadone can be simply detected by a green colour being present in urine. **Note that all urines that are green in colour received by the laboratory will be rejected and an appropriate comment added to the report.** This avoids contamination of the analyser with high levels of methadone, which can carry over into the next patient's sample.

Urine Methadone confirmations using GC-MS are no longer routinely performed on Negative results or green urine samples.

Urine Result	Reported
If both **methadone** and **EDDP** results are less than **100 µg/L**	**Urine Methadone** is reported as **Negative**
If both methadone and **EDDP** results are greater than or equal to **100 µg/L**	**Urine Methadone** is reported as **Positive** and also **Methadone** and **EDDP detected**
If only the **EDDP** result is greater than or equal to **100 µg/L**	**Urine Methadone** is reported as **Positive** and also **Methadone** not detected and **EDDP detected**
If only the **methadone** result is greater than or equal to **100 µg/L**	**Urine Methadone** is reported as **Positive** and also **Methadone** detected and **EDDP not detected**

4.9.2 Buprenorphine Testing

Buprenorphine (**Suboxone, Subutex, Espranor**) is commonly prescribed as medication assisted treatment to people using opiates such as heroin. It can also be used unprescribed by injection or transmucosally (oral or nasal). Long-acting buprenorphine: Buvidal and Sublocade are available as subcutaneous depot injections.

The **Buprenorphine** test set includes the parent drug **Buprenorphine**, and the metabolite **Norbuprenorphine.**

As with methadone, previous testing at QEUH involved an immunoassay screen that did not differentiate between the parent drug and metabolite. This approach led to instances where patients receiving Buprenorphine added buprenorphine to their or another person's urine. This was an issue if sample supervision was not performed. Such behaviour will no longer result in apparent adherence due to the detection of the buprenorphine metabolite, Norbuprenorphine, which detects buprenorphine metabolism and hence adherence.

In certain circumstances (e.g. patients on low doses of buprenorphine) only Norbuprenorphine may be detected, however this is still consistent with compliance with buprenorphine therapy.

Urine Result	**Reported**
If both **Buprenorphine** and **Norbuprenorphine** results are less than **2 µg/L**	**Urine Buprenorphine** is reported as **Negative**
If both **Buprenorphine** and **Norbuprenorphine** results are greater than or equal to **2 µg/L**	**Urine Buprenorphine** is reported as **Positive** and also **Buprenorphine and Norbuprenorphine) detected**
If only the **Norbuprenorphine** result is greater than or equal to 2 µg/L	**Urine Buprenorphine** is reported as **Positive** and also **Buprenorphine not detected and Norbuprenorphine detected**
If only the **Buprenorphine** result is greater than or equal to **2 µg/L**	Urine **Buprenorphine** is reported as **Positive** and also **Buprenorphine detected** and **Norbuprenorphine not detected.**

4.10 Synthetic opioid analgesic testing

4.10.1 Tramadol

Tramadol (**Zydol, Brimisol, Marol**) is a synthetic opioid-receptor agonist that has been used to treat mild to moderate pain, but is also sometimes used by people to whom it is not prescribed. It is typically taken orally with slow release formulations available, but it can also be administered by injection.

Tramadol results are not part of a larger test group.

Urine Result	Reported
If the **Tramadol** result is less than **10 µg/L**	**Urine Tramadol** is reported as **Negative**
If the **Tramadol** result is greater than or equal to **10 µg/L**	**Urine Tramadol** is reported as **Positive**

4.10.2 Oxycodone

Oxycodone (**Oxyact, Longtec, Oxycontin**) is a semi-synthetic narcotic-analgesic that has been used to treat mild to moderate pain. It is usually taken orally. Widespread non-prescribed oxycodone use and dependence is reported in the US.
Oxycodone is metabolised to a relatively inactive metabolite **Noroxycodone**. Both are excreted into the urine and are detected in our LC-MS/MS screen.

Oxycodone results are not part of a larger test group.

Urine Result	Reported
If both **Oxycodone** and **Noroxycodone** results are less than **10 µg/L**	**Urine Oxycodone** is reported as **Negative**
If either the **Oxycodone** or **Noroxycodone** results are greater than or equal to **10 µg/L**	**Urine Oxycodone** is reported as **Positive**

4.10.3 Fentanyl

Fentanyl is a synthetic opioid analgesic which is 50-100 times more potent than morphine. It is prescribed for pain management but also sometimes used by people to whom it is not prescribed. It is frequently administered *via* Fentanyl transdermal patches but is sold on the street in several forms including powders, blotter paper or in pill form. There are also reports of fentanyl being mixed into street heroin. Fentanyl is metabolised to the metabolite Norfentanyl. Both are excreted into the urine and are detected in our LC-MS/MS screen.

Please note that this test does not detect Fentanyl analogues e.g. Carfentinil.

Fentanyl results are not part of a larger test group.

Urine Result	Reported
If both **Fentanyl** and **Norfentanyl** results are less than **10 µg/L**	**Urine Fentanyl** is reported as **Negative**
If **Fentanyl** or **Norfentanyl** results are greater than or equal to **10 µg/L**	**Urine Fentanyl** is reported as **Positive**

4.11 Gabapentinoids

The gabapentinoids (**Gabapentin** and **Pregabalin**) are a class of prescribed drugs used primarily for neuropathic pain and in seizures. They have become widely used by people to whom they are not prescribed in the UK and have been associated with several drug-related deaths in the last decade and have been reclassified as Schedule 3 Controlled Drugs in April 2019.

Gabapentin and Pregabalin are reported as separate tests.

4.11.1 Gabapentin

Reports:

Urine Result	Reported
If the **Gabapentin** result is less than **200 µg/L**	**Urine Gabapentin** is reported as **Negative**
If the **Gabapentin** result is greater than or equal to **200 µg/L**	**Urine Gabapentin** is reported as **Positive**.

4.11.2 Pregabalin

Reports:

Urine Result	Reported
If the **Pregabalin** result is less than **200 µg/L**	Urine **Pregabalin** is reported as **Negative**
If the **Pregabalin** result is greater than or equal to **200 µg/L**	Urine **Pregabalin** is reported as **Positive**.

4.12 Zopiclone

Zopiclone is classed as a Z-drug and is prescribed for short-term treatment of insomnia. It is prescribed in tablet form and has been linked to a number of drug-related deaths Scotland.

Zopiclone results are not part of a larger test group.

Reports:

Urine Result	Reported
If the **Zopiclone** result is less than **10 µg/L**	**Urine Zopiclone** is reported as **Negative**
If the **Zopiclone** result is greater than or equal to **10 µg/L**	**Urine Zopiclone** is reported as **Positive.**

4.13 Street Benzodiazepines

Street or novel benzodiazepines are believed to have similar pharmacological properties to prescribed benzodiazepines such as Diazepam. Street benzodiazepines such are now frequently used drugs in Scotland and there has been a significant increase in deaths attributed to this form of benzodiazepines use in Scotland since 2015.

The **Street Benzodiazepines** screen contains the following parent drugs and drug metabolites:

- **Alprazolam (Xanax) and metabolite (Alpha-hydroxyalprazolam)**
- **Bromazolam**
- **Diclazepam and metabolite (Delorazepam)**
- **Etizolam and metabolite (Alpha-hydroxyetizolam)**
- **Flualprazolam**
- **Phenazepam and metabolite (3-hydroxyphenazepam)**

The **Street Benzodiazepines** screen reports as Positive if any of the drugs in the panel are detected and the drug or drug metabolite in question will be reported along-side this.

Reports:

Urine Result	Reported
If all the **Street Benzodiazepines** results are less than **5 µg/L**	**Urine Street Benzodiazepines** are reported as **Negative**
If any of the **Street Benzodiazepines** parent drugs or metabolites results are greater than or equal to **5 µg/L**	**Urine Street Benzodiazepines** is reported as **Positive**. All the drug or drug metabolites detected is also reported e.g. **Alprazolam/Bromazolam/Diclazepam/Delorazepam/Etizolam/ Flualprazolam/Phenazepam detected** Note each drug is reported as positive if either the parent drug or the drug metabolite (e.g. Alpha-hydroxyetizolam) is detected.

4.14 Ketamine

Ketamine is a dissociative anaesthetic drug that may be used by people to whom it is not prescribed. It is also used therapeutically for short-term anaesthesia in certain clinical settings. Street Ketamine (**Special K, Green K, Super K**) is used largely for its hallucinogenic properties.

Ketamine results are not reported as part of a larger test group.

Urine Result	Reported
If the **Ketamin**e result is less than **10 µg/L**	**Urine Ketamine** is reported as **Negative**
If the **Ketamine** result is greater than or equal to **10 µg/L**	**Urine Ketamine** is reported as **Positive.**

4.15 New psychoactive substances (formerly known as "legal highs")

The use of 'NPS'-type substances is widespread, despite being banned by either the Misuse of Drugs Act 2010 (with various amendments) or the Psychoactive Substances Bill 2016.

The picture is ever-changing with >500 of these compounds known. There are numerous classes of NPS (including synthetic cathinones, synthetic cannabinoids, novel benzodiazepines other than those listed etc.) and these are not detected by this LC-MS/MS urine screen.

If a NPS-type substance is strongly suspected, a urine sample can be sent to an external reference laboratory for testing. However, the result may not be back within a clinically useful time-frame (i.e. >7 days) and the cost of the analysis will have to be cross-charged as it is not covered by the Laboratory budget.

5 Private drug screen requests

The QEUH Laboratory primarily provides a clinical toxicology service. Non-clinical drug tests are not funded by the NHS. Common examples of non-clinical requests include drug testing related to employment or child custody/legal cases. These are often requested via Primary Care. **The tests we routinely carry out for clinical reasons have no chain of custody and are therefore not suitable for these purposes**.

If private drug testing is requested, please contact the Duty Toxicologist to discuss the arrangements for this **in advance of sample collection**.

Private drug testing with chain of custody sampling is provided by the Laboratory, but there is a cost associated with this that should be passed on to the person requesting the test.

6 Samples with medico-legal implications

There are occasionally samples where the drug screen results initially requested for clinical purposes may subsequently have medico-legal significance (e.g. child protection cases etc.).

Please be aware that the QEUH Toxicology Laboratory provides a clinical and not a forensic toxicology service for its users. The level of sample tracking and sample processing (no chain-of-custody) along with the testing strategy is designed for clinical purposes only and is not at a forensic level. Any results that are produced by our laboratory **should not be used as evidence in a court of law**.

In cases where results could potentially become of medico-legal relevance, please contact the Duty Toxicologist (see section 7 for contact details) **in advance of sample collection** for advice on testing.

If samples have already been received within our laboratory that require further testing for medico-legal purposes please contact the Duty Toxicologist for safe keeping. In this instance, it advised that the Police are contacted who can seize samples and send for appropriate forensic testing. Samples can be released for testing by an external forensic level laboratory when appropriate documentation (i.e. a signed letter by the Procurator Fiscal or the Consultant in charge of a patient's care) is provided.

In certain cases where a crime may have been committed (e.g. a patient who thinks their drink has been spiked) the most appropriate course of action is to suggest the patient contacts the Police.

7 Laboratory contact details

Address
Toxicology Section
Biochemistry Department
1st Floor Laboratory Medicine Building
Queen Elizabeth University Hospital
Govan Road
Glasgow G51 4TF

Duty Toxicologist mobile: 07930 867777
Mon-Fri, 9AM to 5PM (excl. Public Holidays)

QEUH Biochemistry Dept. Number: 0141 354 9060

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Appendix 1: Summary of drug and metabolite cut-offs.

Amphetamines	**µg/L**
Amphetamine	**200**
Methamphetamine	**200**
MDMA	**200**

Cocaine	**µg/L**
Cocaine metabolite (Benzoylecgonine)	**100**

Benzodiazepines	**µg/L**
Diazepam and metabolite (Nordiazepam)	**5**
Temazepam	**5**
Oxazepam	**5**
Chlordiazepoxide and metabolite (Demoxepam)	**5**
Clonazepam and metabolite (7-aminoclonazepam)	**5**
Lorazepam	**5**
Nitrazepam and metabolite (7-aminonitrazepam)	**5**

Cannabis (Δ^9-THC metabolites)	**µg/L**
11-nor-9-Carboxy-Δ^9-THC and 11-nor-9-Carboxy-Δ^9- THC glucuronide	**15**

Opiate substitutes	**µg/L**
Buprenorphine and metabolite (Norbuprenorphine)	**2**
Methadone and metabolite (EDDP)	**100**

Opiates	**µg/L**
6-MAM (6-monoacetylmorphine)	**10**
Morphine	**50**
Codeine	**50**
Dihydrocodeine	**50**

Opioids	**µg/L**
Oxycodone and metabolite (Noroxycodone)	**10**
Fentanyl and metabolite (Norfentanyl)	**10**
Tramadol	**10**

Gabapentinoids	**µg/L**
Pregabalin	**200**
Gabapentin	**200**

Z-drugs	**µg/L**
Zopiclone	**10**

Street Benzodiazepines	**µg/L**
Alprazolam and metabolite (Alpha-hydroxyalprazolam)	**5**
Bromazolam	**5**
Diclazepam and metabolite (Delorazepam)	**5**
Etizolam and metabolite (Alpha-hydroxyetizolam)	**5**
Flualprazolam	**5**
Phenazepam and metabolite (3-hydroxyphenazepam)	**5**

Dissociatives	**µg/L**
Ketamine	**10**

Appendix 2: Approximate drug detection windows in urine

Note that detection times of abused drugs within this table are for guidance only.
Detection times may vary widely depending on factors such as dose of drug consumed, frequency of consumption, route of administration, individual metabolism and urine excretion and concentration.

Class	Drug	Detection Period (Days)
Opioids	**Heroin as 6-monoacetylmorphine (6-MAM)**	0.5
	Morphine	1 - 3
	Codeine	1 - 3
	Dihydrocodeine	1 - 3
	Methadone (maintenance)	2 - 4
	Buprenorphine	4 - 6
	Tramadol	1 - 2
	Oxycodone	1 - 2
	Fentanyl	1 - 2
Depressants	**Alcohol**	0.25 - 1
	Benzodiazepines	1 - 3
	ultra-short acting (half-life 2 hours)	0.5
	short-acting (half-life 2-6 hours)	1
	intermediate acting (half-life 6-24 hours) (e.g. Temazepam/Chloridiazepoxide)	2 - 3
	long-acting (half-life 24 hours) (e.g. Diazepam/Nitrazepam)	Up to 7 Days
	extended dosing (1 year)	Up to 30 Days
Stimulants	**Amphetamine, Methamphetamine & MDMA (Ecstasy)**	1 - 2
	Cocaine metabolite, includes 'Crack'	1 - 3
Cannabis	**Cannabinoids (THC, Tetrahydrocannabinol)**	
	single use	1 - 3
	moderate use (4 times/week)	5 - 7
	daily use	10 – 15
	chronic heavy use	Up to 30 Days
Gabape-ntinoids	**Gabapentin**	1 – 3
	Pregabalin	1 – 3
Misc.	**Ketamine**	1 - 3
	Zopiclone	2 - 4