

TOXICOLOGY LABORATORY TEST REPERTOIRE

**Cardiff Toxicology Laboratory
4th Floor, Routledge Academic Centre,
University Hospital Llandough,
Penlan Road
Llandough
CF64 2XX**

Laboratory Open Monday – Friday 08:30 to 17:00

| | |
|-------------------|--|
| General Enquiries | Emma Taylor (Office Manager) Tel – 02921 826894 Email emma.taylor6@wales.nhs.uk |
| Technical advice | Sandra Morgan (Laboratory- Senior Biomedical Scientist) sandra.morgan3@wales.nhs.uk Nichola Norman(Laboratory- Senior Biomedical Scientist) nichola.norman@wales.nhs.uk |
| Clinical advice | Joanne Rogers (Consultant Clinical Scientist) 029 218 26892 or Joanne.Rogers@wales.nhs.uk |

For urgent requests please contact the laboratory. Samples will be processed as soon as it is feasible to do so.

Gel tubes are not acceptable for most assays due to the potential for chromatographic interference. Samples from gel samples are accepted for cholinesterase phenotyping / pseudocholinesterase activity only.

It is possible for other medications to interfere with analysis. Please state current medications.

For therapeutic drug monitoring it is usual to collect trough samples once steady state is achieved. Some exceptions do apply (notably anti-TB drugs and olanzapine).

Samples should be separated and stored at 2-8°C prior to sending (except for thiopental – please see below)

| Assay | Sample Requirement (ml)* | Sample Handling / Transport | Methodology | Reference Range | Turnaround Time (working days) | EQA | Clinical Utility | NHS Charge ¹ 2026/2027 (£) |
|---------------------------------|--|-----------------------------|-------------------|--|--------------------------------|--------------------------|--|---------------------------------------|
| Amiodarone | EDTA Plasma 0.5 mL (minimum vol 200µL) Sample timing less important due to long half-life. Amiodarone is stable in plasma for 24 hours at room temperature or 1 month at -20°C. | First Class Post | LC-MS/MS | 0.5 – 2.0mg/L | 7 | LGC Standards | Therapeutic drug monitoring (limited utility in toxicity due to long tissue half life) | £39.79 |
| Amitriptyline and nortriptyline | EDTA Plasma 2 mL (minimum vol 1 mL) Trough sample | First Class Post | HPLC | Sum of amitriptyline plus nortriptyline 80 – 200 µg/L | 7 | LGC Standards | Therapeutic drug monitoring | £39.79 |
| Carboxy-haemoglobin | EDTA Whole Blood 0.5mL (minimum vol 100uL) | First Class Post | Spectrophotometry | < 2 % Smokers may be higher | 7 | LGC Standards | Suspected exposure / sample not suitable for blood gas analysis | £40.17 |
| Cholinesterase Phenotype | EDTA Plasma 0.5 mL (minimum vol 150uL) If collecting samples after an episode of prolonged apnoea please wait at least 48 hours after surgery. | First Class Post | Spectrophotometry | Total activity: 650 - 1450 U/L | 7 | UK NEQAS sample exchange | Suxamethonium apnoea – assessment of risk | £25.03 |
| Clobazam | EDTA Plasma 200uL (minimum vol 50 uL) | First Class Post | LC-MS/MS | Clobazam: 30 – 300 ug/L Desmethyl Clobazam: 300 – 3000 ug/L | 7 | LGC Standards | Therapeutic drug monitoring (limited utility) | £39.79 |

| Assay | Sample Requirement (ml)* | Sample Handling / Transport | Methodology | Reference Range | Turnaround Time (working days) | EQA | Clinical Utility | NHS Charge ¹ 2026/2027 (£) |
|-----------|---|-----------------------------|-------------|-----------------|--------------------------------|---------------|--|---------------------------------------|
| Clozapine | EDTA Plasma 0.5mL (minimum vol 100uL) Trough sample | First Class Post | LC-MS/MS | 350 – 600 µg/L | 7 | LGC Standards | Therapeutic drug monitoring / toxicity | £29.45 |

| Assay | Sample Requirement (ml)* | Sample Handling / Transport | Methodology | Reference Range | Turnaround Time (working days) | EQA | Clinical Utility | NHS Charge ¹ 2026/2027 (£) |
|---|--------------------------|-----------------------------|---|--|--------------------------------|---------------|------------------|---------------------------------------|
| Drugs of abuse comprising: Opioids: Morphine, Codeine, 6MAM, Dihydrocodeine, Oxycodone, Tramadol Cocaine metabolite Amphetamines: Amphetamine, Methamphetamine, MDMA Benzodiazepines: Alprazolam, Diazepam, Nordiazepam, Oxazepam, Temazepam Fentanyl Cannabis metabolite EDDP Buprenorphine Ketamine Gabapentin Pregabalin | Urine, plain 1mL | First Class Post | UPLC-Accurate mass spectrometry LC-MS/MS | Cut-offs applied to community drug monitoring samples: Amphetamines 200ng/mL, Benzodiazepines 30 ng/mL, Tramadol, Oxycodone and Benzoylcegonine 100 ng/mL, Morphine, Codeine and Dihydrocodeine 300 ng/mL, 6MAM and Fentanyl 10 ng/mL, Cannabis 15 ng/mL, EDDP and Ketamine 75 g/mL, Norbuprenorphine and Buprenorphine 5 ng/mL, Pregabalin 250 ng/mL, Gabapentin 1000 ng/mL Please note, lower cut-offs are applied to paediatric and in-patient samples. | 10 | LGC Standards | Drugs of abuse | £30.12 |

| Assay | Sample Requirement (ml)* | Sample Handling / Transport | Methodology | Reference Range | Turnaround Time (working days) | EQA | Clinical Utility | NHS Charge ¹ 2026/2027 (£) |
|------------|--|-----------------------------|-------------|---|--------------------------------|--------------------|--|---------------------------------------|
| Ethambutol | <p>EDTA Plasma 0.5 mL (minimum vol 250uL)</p> <p>2 h post dose. If suspect delayed absorption collect samples at 2 and 6 h post dose. If concern over toxicity collect pre-dose.</p> <p>Please state sample timing on the request.</p> | First Class Post | GC-MS | <p>2-6 mg/L</p> <p>For peak drug levels for a daily dose regimen. Pre-dose ethambutol concentrations should be less than 1 mg/L</p> | 7 | SKML Anti TB Drugs | Therapeutic drug monitoring / toxicity | £47.13 |

| | | | | | | | | |
|---|--------------------------|-------------------------|--|--|-----------|----------------------|-----------------------|---------------|
| <p>Expanded Toxicology Screen compromising 5F-ADB *</p> <p>ADB-BUTINACA</p> <p>ADB-BUTINACA N-butanoic acid,</p> <p>ADB-4en-PINACA,</p> <p>MDMB-BUTINACA,</p> <p>MDMB-BUTINACA N-butanoic acid,</p> <p>MDMB-4en-PINACA,</p> <p>MDMB-4en-PINACA N-butanoic acid,</p> <p>Clonitazene,</p> <p>Etonitazene,</p> <p>Isotonitazene,</p> <p>Metonitazene,</p> <p>Protonitazene,</p> <p>Etodesnitazene, *</p> <p>Ethyleneoxynitazene,</p> <p>N-piperidinyl Etonitazene,</p> <p>N-pyrrolidino Etonitazene,</p> <p>N-pyrrolidino Isotonitazene,</p> <p>N-pyrrolidino Metonitazene,</p> <p>N-pyrrolidino Protonitazene,</p> <p>N,N-dimethyl etonitazene,</p> <p>4-hydroxy N-pyrrolidino nitazene,</p> <p>N-desethyl Etonitazene,</p> <p>N-desethyl Isotonitazene,</p> <p>N-desethyl metonitazene,</p> <p>N-desethyl Protonitazene,</p> <p>4-hydroxy nitazene,</p> <p>Clonazepam,</p> | <p>Urine, plain 1ml.</p> | <p>First Class Post</p> | <p>UPLC-Accurate mass spectrometry</p> <p>LC-MS/MS</p> | <p>Analytes will be reported as positive or negative against the lower limit of detection (LOD) of the assay. The LOD was determined during method validation. These are relative to analysis conditions at the time and long term LOD will be monitored using spikes at 1 ng/ml and above. Further information of assay performance at the time of analysis, please contact the laboratory.</p> | <p>10</p> | <p>LGC Standards</p> | <p>Drugs of Abuse</p> | <p>£30.12</p> |
|---|--------------------------|-------------------------|--|--|-----------|----------------------|-----------------------|---------------|

| Assay | Sample Requirement (ml)* | Sample Handling / Transport | Methodology | Reference Range | Turnaround Time (working days) | EQA | Clinical Utility | NHS Charge ¹ 2026/2027 (£) |
|--|--------------------------|-----------------------------|-------------|-----------------|--------------------------------|-----|------------------|---------------------------------------|
| 7-amino Clonazepam, Nitrazepam, 7-amino Nitrazepam, Clonazolam, 8-amino clonazolam Flualprazolam, α -hydroxy flualprazolam, Flubromazolam, α -hydroxy flubromazolam, Bromazolam, α -hydroxy bromazolam, Clobromazolam, α -hydroxy clobromazolam, Ethylbromazolam, Desalkylgidazepam, Etizolam, α -hydroxy Etizolam, Flubromazepam * Lorazepam, Midazolam, α -hydroxy midazolam, Pyrazolam, 2C-B, Mephedrone, α -PHP * Eutylone, Pentylone, LSD, Xylazine. | | | | | | | | |

| Assay | Sample Requirement (ml)* | Sample Handling / Transport | Methodology | Reference Range | Turnaround Time (working days) | EQA | Clinical Utility | NHS Charge ¹ 2026/2027 (£) |
|--------------------|--|-----------------------------|-------------|--|--------------------------------|--------------------|-----------------------------|---------------------------------------|
| Flecainide | EDTA Plasma 0.5 mL (minimum vol 200µL) Trough sample Flecainide is stable in the fridge for at least 15 days, and it is stable at -20°C for 2 months. | First Class Post | LC-MS/MS | 0.15 – 0.9 mg/L | 7 | LGC Standards | Therapeutic drug monitoring | £55.83 |
| Hydroxycarbazepine | EDTA Plasma 0.5 mL (minimum vol 100uL) Sample timing less important due to long half-life. | First Class Post | LC-MS/MS | 3 – 35 mg/L | 7 | LGC Standards | Therapeutic drug monitoring | £39.79 |
| Isoniazid | EDTA Plasma 2 mL (minimum vol 1 mL) 2 h post dose. If suspect delayed absorption collect samples at 2 and 6 h post dose. | First Class Post | HPLC | 3 – 5 mg/L For peak drug levels for a daily dose regimen. | 7 | SKML Anti TB Drugs | Therapeutic drug monitoring | £47.13 |
| Isopropanol | <i>see Volatile Alcohols</i> | | | | | | | |
| Itraconazole | EDTA Plasma 0.5 mL (minimum vol 250uL) Trough sample | First Class Post | HPLC | ➤ 0.5mg/L | 7 | UK NEQAS | Therapeutic drug monitoring | Assay no longer available |

| Assay | Sample Requirement (ml)* | Sample Handling / Transport | Methodology | Reference Range | Turnaround Time (working days) | EQA | Clinical Utility | NHS Charge ¹ 2026/2027 (£) |
|---------------|---|---|-------------|-----------------|--------------------------------|--------------------|-----------------------------|---------------------------------------|
| Lamotrigine | EDTA Plasma 0.5 mL (minimum vol 100uL) Trough sample | First Class Post | LC-MS/MS | 3 – 15 mg/L | 7 | LGC Standards | Therapeutic drug monitoring | £25.03 |
| Levetiracetam | EDTA Plasma 0.5 mL (minimum vol 100uL) Trough sample | Levetiracetam is not stable in whole blood and plasma should be separated on the day of receipt and then stored in the fridge prior to sending. An 11% loss after 2 days has been reported in whole blood samples kept at room temperature. First Class Post | LC-MS/MS | 12 – 46 mg/L | 7 | LGC Standards | Therapeutic drug monitoring | £25.03 |
| Methanol | <i>see Volatile Alcohols</i> | | | | | | | |
| Mexiletine | EDTA Plasma 0.5 mL (minimum vol 200µL) Mexiletine is stable in plasma for 24 hours at room temp and 1 month at -20°C. | First Class Post | LC-MS/MS | 0.6 – 1.7 mg/L | 7 | Reference Material | Therapeutic drug monitoring | £39.79 |

| Assay | Sample Requirement (ml)* | Sample Handling / Transport | Methodology | Reference Range | Turnaround Time (working days) | EQA | Clinical Utility | NHS Charge ¹ 2026/2027 (£) |
|--------------------------------------|---|--|-------------------|---|--------------------------------|---------------------------------------|--|---------------------------------------|
| Midazolam / 1-Hydroxymidazolam | EDTA Plasma 200uL (minimum vol 50 uL) In brain stem death testing, >13h after infusion has stopped | Discuss with laboratory prior to sending samples. Courier if urgent. | LC-MS/MS | LLOQ of 10 ug/L. Consider application of neurological criteria in light of result. | 24 Hours | LGC Standards & Reference Material | Prior to application of neurological criteria in confirmation of death | £250.00 |
| Mitotane | EDTA Plasma 0.5 mL (minimum vol 150uL) Trough sample / >12h post dose | First Class Post | GC-MS | 14 – 20 mg/L | 7 | Reference Material | Therapeutic drug monitoring | £39.79 |
| Olanzapine | EDTA Plasma 0.5 mL (minimum vol 100uL) 12 hours post dose | Samples must be separated within 7 hours. Protect from light First Class Post | LC-MS/MS | 20 – 40 µg/L 12h post dose | 7 | LGC Standards | Therapeutic drug monitoring | £47.13 |
| Oxcarbazepine | See <i>hydroxycarbazepine</i> | | | | | | | |
| Perhexiline | EDTA Plasma 0.5 mL (minimum vol 250uL) | First Class Post | GC-MS | 0.15 – 0.60 | 7 | Perhexiline QA Programme QEHAustralia | Therapeutic drug monitoring | £29.45 |
| Pseudocholinesterase (activity only) | EDTA Plasma 0.5 mL (minimum vol 150uL) | First Class Post | Spectrophotometry | 650 – 1450 U/L | 7 | UK NEQAS sample exchange | Acute organo-phosphate exposure (limitations apply) For assessment of risk for suxamethonium apnoea cholinesterase phenotyping is usually advised | £22.08 |

| Assay | Sample Requirement (ml)* | Sample Handling / Transport | Methodology | Reference Range | Turnaround Time (working days) | EQA | Clinical Utility | NHS Charge ¹ 2026/2027 (£) |
|---------------------------------------|---|---|-------------|---|--------------------------------|--------------------|---|---------------------------------------|
| Pyrazinamide | EDTA Plasma 0.5 mL (minimum vol 150uL) 2 h post dose. If suspect delayed absorption collect samples at 2 and 6 h post dose. | First Class Post | HPLC | 20-40 mg/L For peak drug levels for a daily dose regimen | 7 | SKML Anti TB Drugs | Therapeutic drug monitoring | £39.79 |
| Quetiapine | EDTA Plasma 0.5 mL (minimum vol 100 uL) | First Class Post | LC-MS/MS | 50-500 µg/L | 7 | LGC Standards | Therapeutic drug monitoring (limited utility) | £39.79 |
| Risperidone and 9-hydroxy risperidone | EDTA Plasma 0.5 mL (minimum vol 100uL) Sample timing less important due to long half-life. | First Class Post | LC-MS/MS | Total risperidone (sum of risperidone and 9-hydroxy risperidone) 20-60 µg/L | 7 | LGC Standards | Therapeutic drug monitoring | £39.79 |
| Thiopental – Currently unavailable | EDTA Plasma 1 mL (minimum vol 250uL) | Discuss with laboratory prior to sending samples. Due to stability concerns samples MUST arrive within 12 hours of venepuncture . Alternatively plasma may be frozen for transportation. | GC-NPD | None | 24 Hours. | Reference Material | Brain stem death testing. | £258.00 |

| Assay | Sample Requirement (ml)* | Sample Handling / Transport | Methodology | Reference Range | Turnaround Time (working days) | EQA | Clinical Utility | NHS Charge ¹ 2026/2027 (£) |
|--|--|-----------------------------|-------------|-----------------|--------------------------------|---------------|-----------------------------|---------------------------------------|
| Topiramate | EDTA Plasma 0.5 mL (minimum vol 100uL) Sample timing less important due to long half-life. | First Class Post | LC-MS/MS | 5 – 20 mg/L | 7 | LGC Standards | Therapeutic drug monitoring | £25.03 |
| Volatile Alcohols (methanol, ethanol, isopropanol and acetone) | Fluoride Oxalate Plasma Fluoride Oxalate Blood Urine, plain | Courier if urgent. | GC-FID | N/A | 24 Hours | LGC Standards | Suspected toxicity | £53.25 |

*Minimum volumes do not allow for repeat analysis in case of assay failure.

¹An additional sample handling charge of £5.67 per sample from NHS Wales and £6.14 per sample for non-Welsh locations applies.

There is a surcharge for non-NHS patients as follows:

An additional charge of £5 for tests less than £20

An additional charge of 25% for those tests greater than £20