

Order information

| REF | CONTENT | System-ID | Analyzers on which cobas c pack can be used |
|--------------|--|-----------|--|
| 20738042 122 | Abuscreen OnLine Phencyclidine (200 tests) | 07 3804 2 | COBAS INTEGRA 400 plus COBAS INTEGRA 800 |
| 03304671 190 | Preciset DAT Plus I CAL 1-6 (6 × 5 mL) | | |
| 03304698 190 | C.f.a.s. DAT Qualitative Plus (6 × 5 mL) | | |
| 04590856 190 | C.f.a.s. DAT Qualitative Plus Clinical (3 × 5 mL) | | |
| 03312950 190 | Control Set DAT I PreciPos DAT Set I (2 × 10 mL) PreciNeg DAT Set I (2 × 10 mL) | | |
| 04500873 190 | Control Set DAT Clinical PreciPos DAT Clinical (2 × 10 mL) PreciNeg DAT Clinical (2 × 10 mL) | | |

English

System information

Test PCPS, test-ID 0-510 for semiquantitative assay

Test PCPQL, test-ID 0-610 for qualitative assay

Test PCPQC, test-ID 0-110 for qualitative assay using C.f.a.s. DAT Qualitative Plus Clinical

Intended use

Phencyclidine (PCP) is an in vitro diagnostic test for the semiquantitative and qualitative detection of phencyclidine and its metabolites in human urine at a cutoff concentration of 25 ng/mL on COBAS INTEGRA systems. Semiquantitative test results may be obtained that permit laboratories to assess assay performance as part of a quality control program. Semiquantitative assays are intended to determine an appropriate dilution of the specimen for confirmation by a confirmatory method such as gas chromatography/mass spectrometry (GC/MS).

Phencyclidine provides only a preliminary analytical test result. A more specific alternate chemical method must be used in order to obtain a confirmed analytical result. GC/MS is the preferred confirmatory method.¹ Clinical consideration and professional judgment should be applied to any drug of abuse test result, particularly when preliminary positive results are used.

Summary

Phencyclidine (PCP) is an arylcyclohexylamine with potent analgesic and anesthetic properties.^{1,2,3,4,5,6} Originally developed as an intravenous anesthetic, the occurrence of emergence psychosis side effects negated its potential clinical utility. PCP was never approved for human use because of the post-anesthetic confusion and delirium that arose during clinical studies. Illegally sold on the street, PCP is known by various names such as "angel dust"; whereas, names such as "supergrass" refer to PCP combined with marijuana. PCP possesses hallucinogenic, central nervous system (CNS)-stimulant, and CNS-depressant properties, the expression of which is dose- and species-dependent.⁴ PCP and its structural analog, ketamine, are NMDA (N-methyl-D-aspartate) receptor antagonists.^{2,5} Known as dissociative anesthetics, they produce mind-altering feelings of dissociation from the environment and self. Dextromethorphan, a cough suppressant, can produce similar effects when taken in high doses.⁶

The water-soluble powder of PCP can be ingested, snorted, injected intravenously, or smoked. Typical street doses (1-10 mg) can cause tachycardia, hypertension, hallucinations, stupor, lethargy, sensory isolation, and loss of coordination. Excitation and agitation may also occur, leading to unpredictably violent behavior not usually encountered with other hallucinogens. Repeated use of PCP can result in addiction and higher doses can cause symptoms that mimic schizophrenia and can culminate in convulsions and prolonged or fatal coma.^{2,6}

PCP is metabolized via ring-hydroxylation and oxidation by the cytochrome P450 enzymes.^{3,7} An amino acid metabolite of PCP exists in human urine in significant quantities.⁸ Significant variations in the PCP elimination half-life have been found in humans; however, phase II metabolism of PCP sulfation and glucuronidation could also contribute to the variation in PCP half-life.⁷

Test principle

Kinetic interaction of microparticles in a solution (KIMS)⁹ as measured by changes in light transmission.

In the absence of sample drug, free antibody binds to drug-microparticle conjugates causing the formation of particle aggregates. As the aggregation reaction proceeds in the absence of sample drug, the absorbance increases.

When a urine sample contains the drug in question, this drug competes with the particle-bound drug derivative for free antibody. Antibody bound to sample drug is no longer available to promote particle aggregation, and subsequent particle lattice formation is inhibited. The presence of sample drug diminishes the increasing absorbance in proportion to the concentration of drug in the sample. Sample drug content is determined relative to the value obtained for a known cutoff concentration of drug.

Reagents - working solutions

| | |
|-----------------------------------|--|
| Sample Diluent (SD) | Buffer containing stabilizer and 0.09 % sodium azide. |
| Antibody Reagent (AB) | PCP antibody (mouse monoclonal) in buffer with stabilizer and 0.09 % sodium azide. |
| Microparticle Reagent (MP) | Conjugated PCP derivative microparticles in buffer and 0.09 % sodium azide. |

SD is in position A, AB is in position B and MP is in position C.

Pipetting Sequence

| | |
|---------------------------------|------------------------------------|
| COBAS INTEGRA 400 plus analyzer | R1 = AB R2 = SD R3 (SR) = MP |
| COBAS INTEGRA 800 analyzer | R1 = SD R2 = AB R3 (SR) = MP |

Precautions and warnings

Pay attention to all precautions and warnings listed in Section 1 / Introduction of this Method Manual.

For USA: Caution: Federal law restricts this device to sale by or on the order of a physician.

Reagent handling

COBAS INTEGRA 400 plus analyzer

Mix all new (non-punctured) **cobas c** packs for 1 minute on a cassette mixer before loading on the analyzer. All in-use **cobas c** packs must also be mixed in the same manner at the beginning of each week (once a week).

COBAS INTEGRA 800 analyzer

Ready for use. After **cobas c** pack puncture, the analyzer automatically mixes the reagent for 1 minute and for half a minute during Begin of Day.

Storage and stability

| | |
|-----------------------|--|
| Shelf life at 2-8 °C: | See expiration date on cobas c pack label |
|-----------------------|--|

COBAS INTEGRA 400 plus analyzer

On-board in use at 10-15 °C 69 days
COBAS INTEGRA 800 analyzer

On-board in use at 8 °C 89 days

Do not freeze reagents. Reagents that have been frozen should be discarded.

Specimen collection and preparation

Only the specimens listed below were tested and found acceptable.

Urine: Collect urine samples in clean glass or plastic containers. Fresh urine specimens do not require any special handling or pretreatment, but an effort should be made to keep pipetted samples free of gross debris. Samples should be within the normal physiological pH range of 5-8. No additives or preservatives are required. It is recommended that urine specimens be stored at 2-8 °C and tested within 5 days of collection.¹⁰

For prolonged storage, freezing of the sample is recommended.

Centrifuge highly turbid specimens before testing.

Adulteration or dilution of the sample can cause erroneous results. If adulteration is suspected, another sample should be collected. Specimen validity testing is required for specimens collected under the *Mandatory Guidelines for Federal Workplace Drug Testing Programs*.¹¹

Caution: Specimen dilutions should only be used as an estimation for GC/MS and are not intended for patient values. Dilution procedures, when used, should be validated.

Materials provided

See "Reagents – working solutions" section for reagents.

Assay

For optimum performance of the assay follow the directions given in this document for the analyzer concerned. Refer to the appropriate operator's manual for analyzer-specific assay instructions.

Application for urine

COBAS INTEGRA 400 plus test definition

| | <i>Semiquantitative</i> | <i>Qualitative</i> |
|-----------------------|------------------------------|--------------------|
| Measuring mode | Absorbance | Absorbance |
| Abs. calculation mode | Endpoint | Endpoint |
| Reaction mode | R1-R2-S-SR | R1-R2-S-SR |
| Reaction direction | Increase | Increase |
| Reaction start | SR | SR |
| Wavelength A | 520 nm | 520 nm |
| Test range | 0-50 ng/mL | 0-3000 |
| with postdilution | 0-500 ng/mL | |
| Postdilution factor | 10 recommended ^{a)} | No |
| Calc. first/last | 49/67 | 49/67 |
| Unit | ng/mL | |

a) For use when estimating concentration in preparation for GC/MS analysis.

Pipetting parameters

| | | Diluent (H ₂ O) |
|--------------|--------|----------------------------|
| R1 | 53 µL | 6 µL |
| R2 | 42 µL | 15 µL |
| Sample | 10 µL | 6 µL |
| SR | 15 µL | 12 µL |
| Total volume | 159 µL | |

COBAS INTEGRA 800 test definition

| | <i>Semiquantitative</i> | <i>Qualitative</i> |
|-----------------------|-------------------------|--------------------|
| Measuring mode | Absorbance | Absorbance |
| Abs. calculation mode | Endpoint | Endpoint |

| | | |
|---------------------|------------------------------|------------|
| Reaction mode | R1-R2-S-SR | R1-R2-S-SR |
| Reaction direction | Increase | Increase |
| Reaction start | SR | SR |
| Wavelength A | 520 nm | 520 nm |
| Test range | 0-50 ng/mL | 0-3000 |
| with postdilution | 0-500 ng/mL | |
| Postdilution factor | 10 recommended ^{b)} | No |
| Calc. first/last | 44/78 | 44/78 |
| Unit | ng/mL | |

b) For use when estimating concentration in preparation for GC/MS.

Pipetting parameters

| | | Diluent (H ₂ O) |
|--------------|--------|----------------------------|
| R1 | 42 µL | 6 µL |
| R2 | 53 µL | 6 µL |
| Sample | 10 µL | 6 µL |
| SR | 12 µL | 6 µL |
| Total volume | 141 µL | |

Calibration

| Calibrators | <i>Semiquantitative application</i> |
|---------------------|---|
| <i>PCPS, 0-510</i> | Preciset DAT Plus I calibrators, CAL 1-4 0, 12.5, 25, 50 ng/mL phencyclidine (DATS9, system-ID 07 6798 0) |
| | <i>Qualitative applications</i> |
| <i>PCPQL, 0-610</i> | Preciset DAT Plus I calibrators, CAL 1 0 ng/mL or deionized water and Preciset DAT Plus I calibrators, CAL 3 ^{c)} or C.f.a.s. DAT Qualitative Plus 25 ng/mL (DATQ1, system-ID 07 6744 1) |
| <i>PCPQC, 0-110</i> | Preciset DAT Plus I or II ^{d)} calibrators, CAL 1 0 ng/mL or deionized water and C.f.a.s. DAT Qualitative Plus Clinical 25 ng/mL (DATQ5, system-ID 07 6880 4) |
| | For qualitative applications, the cutoff value is assigned as 1000. |

c) Do not use Preciset DAT Plus I, CAL 3 if calibrating the Opiates 300/2000 qualitative 2000 ng/mL assay (test OP2QL, test-ID 0-410).

d) Preciset DAT Plus II, CAL 1, while generally not required for the calibration of Phencyclidine, may be used as an alternative 0 ng/mL level for DATQ5, system-ID 07 6880 4.

| Calibration mode | <i>Semiquantitative application</i> |
|--|---|
| | Linear interpolation |
| | <i>Qualitative applications</i> |
| | Linear regression |
| Calibration replicate | Duplicate recommended |
| Calibration interval | COBAS INTEGRA 400 plus analyzer: Each lot, every 70 days, and as required following quality control procedures COBAS INTEGRA 800 analyzer: Each lot, every 30 days, and as required following quality control procedures |
| Calibration interval may be extended based on acceptable verification of calibration by the laboratory. | |

A calibration curve is generated using the calibrators. Calibrators must be placed from the highest concentration first to the lowest last on the CAL/QC rack. This curve is retained in memory by the COBAS INTEGRA system and recalled for later use.

Traceability: This method has been standardized against a primary reference method (GC/MS).

Quality control

| | |
|-----------------|---|
| Quality control | Control Set DAT I |
| | PreciPos DAT Set I (DAT1P, system-ID 07 6753 0) |
| | PreciNeg DAT Set I (DAT1N, system-ID 07 6754 9) |
| | or |
| | Control Set DAT Clinical |
| | PreciPos DAT Clinical (DATCP, system-ID 07 6879 0) |
| | PreciNeg DAT Clinical (DATCN, system-ID 07 6878 2) |

Control sequence User defined

Control after calibration Recommended

For quality control, use control materials as listed in the "Order information" section. In addition, other suitable control material can be used.

Drug concentrations of Control Set DAT I and Clinical have been verified by GC/MS.

The control intervals and limits should be adapted to each laboratory's individual requirements. Values obtained should fall within the defined limits. Each laboratory should establish corrective measures to be taken if values fall outside the defined limits.

Follow the applicable government regulations and local guidelines for quality control.

Results

COBAS INTEGRA systems report results with the following test flags:

Semiquantitative result reporting

| Flag | COBAS INTEGRA | Value range |
|-----------|---------------|-------------|
| No flag | Negative | < 25 ng/mL |
| <TEST RNG | Negative | < 0 ng/mL |
| >TEST RNG | Positive | > 50 ng/mL |
| POS 25 | Positive | ≥ 25 ng/mL |

Value ranges listed above are based on a cutoff value of 25 ng/mL.

Qualitative result reporting

| Flag | COBAS INTEGRA | Value range |
|-----------|---------------|-------------|
| No flag | Negative | < 1000 |
| <TEST RNG | Negative | < 0 |
| >TEST RNG | Positive | > 3000 |
| POS 1000 | Positive | ≥ 1000 |

Value ranges above are based on assigning the cutoff of 25 ng/mL a value of 1000.

Semiquantitative result reporting

The semiquantitation of preliminary positive results should only be used by laboratories to determine an appropriate dilution of the specimen for confirmation by a confirmatory method such as GC/MS. It also permits the laboratory to establish quality control procedures and assess control performance.

Note: When using the post-dilution function (1:10 dilution), to ensure the sample was not over-diluted, the diluted result must be at least half the analyte cutoff value times 10. If the diluted result falls below half the analyte cutoff value times 10, repeat the sample with a smaller dilution. A dilution

that produces a result closest to the analyte cutoff is the most accurate estimation. To estimate the preliminary positive sample's concentration, multiply the result by the appropriate dilution factor. Dilutions should only be used as an estimation for GC/MS.

Limitations - interference

See the "Specific performance data" section of this document for information on substances tested with this assay. There is the possibility that other substances and/or factors may interfere with the test and cause erroneous results (e.g., technical or procedural errors).

A preliminary positive result with this assay indicates the presence of PCP in urine. It does not measure the level of intoxication.

For diagnostic purposes, the results should always be assessed in conjunction with the patient's medical history, clinical examination and other findings.

ACTION REQUIRED

Special Wash Programming: The use of special wash steps is mandatory when certain test combinations are run together on COBAS INTEGRA analyzers. Refer to the CLEAN Method Sheet for further instructions and for the latest version of the Extra wash cycle list.

Where required, special wash/carry-over evasion programming must be implemented prior to reporting results with this test.

Specific performance data

Representative performance data on the COBAS INTEGRA analyzers are given below. Results obtained in individual laboratories may differ.

Precision

Precision was determined in an internal protocol using a series of controls in replicates of 40, once a day, for 5 days. The following results were obtained on a COBAS INTEGRA 700 analyzer.

Semiquantitative precision

| Repeatability | Mean ng/mL | SD ng/mL | CV % |
|---------------|---------------|-------------|---------|
| Level 1 | 12 | 1.1 | 9.6 |
| Level 2 | 20 | 0.8 | 4.3 |
| Level 3 | 24 | 1.1 | 4.6 |
| Level 4 | 31 | 1.6 | 5.2 |

| Intermediate precision | Mean ng/mL | SD ng/mL | CV % |
|------------------------|---------------|-------------|---------|
| Level 1 | 12 | 1.2 | 10.0 |
| Level 2 | 20 | 1.1 | 5.5 |
| Level 3 | 24 | 1.4 | 5.7 |
| Level 4 | 31 | 2.2 | 7.1 |

Qualitative precision

| Cutoff (x) | Number tested | Correct results | Confidence level |
|------------|------------------|--------------------|-------------------------|
| 0.8x | 200 | 200 | > 95 % negative reading |
| 1.2x | 200 | 200 | > 95 % positive reading |

Lower detection limit of the test

5.0 ng/mL

The lower detection limit represents the lowest measurable analyte level that can be distinguished from zero. It is calculated as the value lying 2 standard deviations above that of the zero calibrator (zero calibrator + 2 SD, repeatability, n = 40).

Accuracy

100 urine samples, obtained from a clinical laboratory where they screened negative in a drug test panel by another technology, were evaluated for PCP on the COBAS INTEGRA systems. All 100 clinical samples were negative relative to the 25 ng/mL cutoff.

Abuscreen OnLine Phencyclidine

50 urine samples, obtained from clinical laboratories where they screened preliminary positive by a commercially available enzyme immunoassay and confirmed positive for PCP by GC/MS, were also evaluated on a COBAS INTEGRA 700 analyzer. All 50 samples were positive with the COBAS INTEGRA Phencyclidine assay relative to the 25 ng/mL cutoff.

| | | GC/MS | |
|----------------------------|---|-------|---|
| | | + | - |
| COBAS INTEGRA 700 analyzer | + | 50 | 0 |
| | - | 0 | 0 |

Analytical specificity

The specificity of the COBAS INTEGRA Phencyclidine assay was determined by generating inhibition curves for each of the compounds listed and determining the approximate quantity of each compound that is equivalent in assay reactivity to the 25 ng/mL PCP assay cutoff.

| Compound | Approximate ng/mL equivalent to 25 ng/mL of PCP | Approximate percent cross-reactivity |
|-----------------------------------|--|--|
| Thienylcyclohexylpiperidine (TCP) | 30 | 83 |
| Chlorprothixene | 92857 | 0.03 |
| Dextromethorphan | 137787 | 0.02 |

Drug interference

The following compounds were added to aliquots of pooled normal human urine at a concentration of 100000 ng/mL. None of these compounds gave values in the assay that were equal to or greater than 0.5 % cross reactivity.

| | |
|-----------------------|------------------------------|
| Acetaminophen | Ibuprofen |
| Acetylsalicylic acid | Imipramine |
| Aminopyrine | Isoproterenol |
| Amitriptyline | Ketamine |
| Amobarbital | Lidocaine |
| <i>d</i> -Amphetamine | LSD |
| <i>l</i> -Amphetamine | MDA |
| Ampicillin | MDMA |
| Ascorbic acid | Melanin |
| Aspartame | Meperidine |
| Atropine | Methadone |
| Benzocaine | <i>d</i> -Methamphetamine |
| Benzoyllecgonine | Methaqualone |
| (cocaine metabolite) | Methylphenidate |
| Benzphetamine | Methpyrrolon |
| Butabarbital | Morphine |
| Caffeine | Naloxone |
| Calcium hypochlorite | Naltrexone |
| Carbamazepine | Naproxen |
| Chlordiazepoxide | Niacinamide |
| Chloroquine | Nordoxepin |
| Chlorpheniramine | Norethindrone |
| Chlorpromazine | <i>l</i> -Norpseudoephedrine |
| Cocaine | Ofloxacin |
| Codeine | Oxazepam |
| Cyclobenzaprine | Penicillin G |
| Dextropropoxyphene | Pentobarbital |

| | |
|------------------------------|----------------------------------|
| Diazepam | β -Phenethylamine |
| Diphenhydramine | Phenobarbital |
| Dopamine | Phenothiazine |
| Doxepin | Phentermine |
| Doxylamine | Phenylbutazone |
| Ecgonine | <i>d</i> -Phenylpropanolamine |
| Ecgonine methyl ester | <i>d,l</i> -Phenylpropanolamine |
| <i>d</i> -Ephedrine | Procaine |
| <i>d,l</i> -Ephedrine | Promethazine |
| <i>l</i> -Ephedrine | <i>d</i> -Pseudoephedrine |
| Epinephrine | <i>l</i> -Pseudoephedrine |
| Erythromycin | Quinidine |
| Estriol | Quinine |
| Fenopropfen | Secobarbital |
| Furosemide | Sulindac |
| Gentisic acid | Tetracycline |
| Glutethimide | Δ^9 THC-9-carboxylic acid |
| Guaiaacol glycerol ether | Tetrahydrozoline |
| Hydrochlorothiazide | Trifluoperazine |
| <i>p</i> -Hydroxyamphetamine | Tyramine |
| Hydroxyzine | Verapamil |

Any modification of the instrument as set forth in this labeling requires validation by the laboratory.




References

- Karch SB, ed. Drug Abuse Handbook. Boca Raton, FL: CRC Press LLC 1998.
- Hardman JG, Limbird LE, Gilman A, eds. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 10th ed. New York, NY: McGraw Hill Pub Co. 2001.
- Baselt RC. Disposition of Toxic Drugs and Chemicals in Man. 7th ed. Foster City, CA: Biomedical Publications 2004.
- Clouet DH, ed. Phencyclidine: An Update. NIDA Research Monograph 64. National Institute on Drug Abuse 1986.
- De Souza EB, Clouet D, London ED, eds. Sigma, PCP, and NMDA receptors. Research Monograph 133. National Institute on Drug Abuse 1993.
- Leshner AI. Hallucinogens and dissociative, including LSD, PCP, Ketamine, dextromethorphan. NIH Publication Number 01-4209, NIDA Research Report Series 2001.
- Laurenzana EM, Owens SM. Metabolism of phencyclidine by human liver microsomes. Drug Metab Dispos 1997;25:557-663.
- EISohly MA, Little TL Jr, Mitchell JM, et al. GC/MS analysis of phencyclidine acid metabolite in human urine. J Anal Toxicol 1988;12:180-182.
- Armbruster DA, Schwarzhoff RH, Pierce BL, et al. Method comparison of EMIT II and ONLINE with RIA for drug screening. J Forensic Sci 1993;38:1326-1341.
- Toxicology and Drug Testing in the Clinical Laboratory; Approved Guideline. 2nd ed. (C52-A2). Clinical and Laboratory Standards Institute 2007;27:33.
- Mandatory Guidelines for Federal Workplace Drug Testing Programs. Fed Regist 2008 Nov 25;73:71858-71907.

A point (period/stop) is always used in this Method Sheet as the decimal separator to mark the border between the integral and the fractional parts of a decimal numeral. Separators for thousands are not used.

Symbols

Roche Diagnostics uses the following symbols and signs in addition to those listed in the ISO 15223-1 standard (for USA: see <https://usdiagnostics.roche.com> for definition of symbols used):

| | |
|---|---------------------------------------|
|  | Contents of kit |
|  | Volume after reconstitution or mixing |
|  | Global Trade Item Number |

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