BARB

cobas®

ONLINE DAT Barbiturates Plus

Order information

REF		CONTENT		Analyzer(s) on which **cobas c** pack(s) can be used
08056889190	08056889500	ONLINE DAT Barbiturates Plus (**cobas c** pack 1), 850 tests (**cobas c** pack 2), 850 tests	System-ID 2026 011 System-ID 2026 012	**cobas c** 303, **cobas c** 503, **cobas c** 703

Materials required (but not provided):

Serum/plasma		
03304671190	Preciset DAT Plus I CAL 3 (1 x 5 mL)	Code 20433
07978766190	Serum DAT Control Low (ACQ Partner Channel*)	
07978740190	Serum DAT Control High (ACQ Partner Channel*)	
09543112190	Serum DAT Control Set	

*Roche does not hold the product registration for Partner Channels. The legal manufacturer indicated on the kit is solely responsible for all of the design, legal, and regulatory aspects of the product.

Urine		
03304671190	Preciset DAT Plus I CAL 1-6 (6 x 5 mL)	Codes 20431-20436
03304698190	C.f.a.s. DAT Qualitative Plus (6 x 5 mL)	Code 20698
04590856190	C.f.a.s. DAT Qualitative Plus Clinical (3 x 5 mL)	Code 20699
03312950190	Control Set DAT I PreciPos DAT Set I (2 x 10 mL) PreciNeg DAT Set I (2 x 10 mL)	
04500873190	Control Set DAT Clinical PreciPos DAT Clinical (2 x 10 mL) PreciNeg DAT Clinical (2 x 10 mL)	

English

System information

BAQ2S: ACN 20263 (Serum/plasma): for qualitative assay, 200 ng/mL

BA2QP: ACN 20260 (Urine): for qualitative assay, 200 ng/mL

BA2SP: ACN 20261 (Urine): for semiquantitative assay, 200 ng/mL

BA2QC: ACN 20262 (Urine): for qualitative assay, 200 ng/mL; using C.f.a.s. DAT Qualitative Plus Clinical

BA2-QP: ACN 20264 (Urine): for qualitative assay, 200 ng/mL; using C.f.a.s. DAT Qualitative Plus

Intended use

Application in urine

Barbiturates Plus (BARB) is an in vitro diagnostic test for the qualitative and semiquantitative detection of barbiturates in human urine on **cobas c** systems at a cutoff concentration of 200 ng/mL. 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).

Barbiturates Plus 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.

Application in serum and plasma*

**not available in all countries*

Barbiturates Plus (BARB) is an in vitro diagnostic test for the qualitative detection of barbiturates in human serum and plasma on **cobas c** systems at a cutoff concentration of 200 ng/mL.

The assay provides only a preliminary analytical test result. A more specific alternate chemical method must be used in order to obtain a confirmed analytical result. Gas chromatography/mass spectrometry (GC-MS) or Liquid Chromatography coupled with Tandem Mass Spectrometry (LC-MS/MS) is the preferred confirmatory method.[1] Clinical considerations and professional judgment should be applied to any drug of abuse test result, particularly when preliminary positive results are used.

Summary

Detection of barbiturates with this assay in human serum, plasma and urine is used for presumptive testing of exposure to barbiturates in individuals with suspected exposure.

The barbiturates, a class of drugs derived from barbituric acid (malonylurea), are sedative hypnotics with central nervous system (CNS)-depressant activity.[2,3,4] Classification is based on relative duration of action: ultra short-, short-, intermediate-, and long-acting agents.[2,4] Although their utility as sedative-hypnotics has been largely replaced by the benzodiazepines, barbiturates still maintain an important role as anesthetics and anticonvulsants.[2,3] In addition, especially the short- and intermediate-acting ones continue to be subject to abuse.[2] Excessive dosages may cause impaired motor coordination (slurred speech, loss of coordination), perceptual alterations (faulty judgment, emotional lability), and euphoria.[4,5] Overdoses can result in stupor, coma, and fatal respiratory arrest.[4] The combined use of the barbiturates with alcohol, opiates, or other CNS-depressants increases the risk of fatal, additive respiratory depression.[5] Barbiturates have high volumes of distribution, so serum levels do not accurately reflect CNS concentrations or correlate with clinical severity.[4] Most of the barbiturates are metabolized by the liver.[2,5] As a drug class, the barbiturates are excreted as active drug / metabolite mixes whose ratios and concentrations depend on the specific barbiturate in question.[2,5] A positive urine screen establishes only exposure to a barbiturate.[4] In the context of drug screening, samples that test negative on initial screening tests can be reported as negative and disposed of as planned. Otherwise, depending on the situation, presence of the drugs indicated by a positive screening result may need to be confirmed using a suitable confirmatory technique (e.g., GC-MS or LC-MS).[6,7,8,9]

Test principle

The assay is based on the kinetic interaction of microparticles in a solution (KIMS)[10,11] 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 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

R1 Buffer; 0.09 % sodium azide

R2 Secobarbital antibody (sheep polyclonal); buffer; bovine serum albumin; 0.09 % sodium azide

R3 Conjugated secobarbital derivative microparticles; buffer; bovine serum albumin; 0.09 % sodium azide

Cat. No. 08056889190 consists of 2 **cobas c** packs: 1 x R1 + R2 and 1 x R3. R1 is in cassette position B and R2 is in cassette position C of **cobas c** pack 1. R3 is in cassette position C of **cobas c** pack 2.

Precautions and warnings

For in vitro diagnostic use for laboratory professionals. Exercise the normal precautions required for handling all laboratory reagents.

Infectious or microbial waste:
Warning: handle waste as potentially biohazardous material. Dispose of waste according to accepted laboratory instructions and procedures.

Environmental hazards:
Apply all relevant local disposal regulations to determine the safe disposal.

Safety data sheet available for professional user on request.

Reagent handling

Ready for use

Carefully invert reagent container several times prior to use to ensure that the reagent components are mixed.

Storage and stability

Shelf life at 2-8 °C:	See expiration date on **cobas c** pack label
On-board in use and refrigerated on the analyzer:	26 weeks

Do not freeze.

Specimen collection and preparation

For specimen collection and preparation only use suitable tubes or collection containers.

Only the specimens listed below were tested and found acceptable.
Serum: Serum tubes with and without separating gel.
Plasma: K_2- or K_3-EDTA, Li-heparin plasma.

The sample types listed were tested with a selection of sample collection tubes that were commercially available at the time of testing, i.e. not all available tubes of all manufacturers were tested. Sample collection systems from various manufacturers may contain differing materials which could affect the test results in some cases. When processing samples in primary tubes (sample collection systems), follow the instructions of the tube manufacturer.

Stability in serum/plasma:

5 days capped at 15-25 °C

14 days capped at 2-8 °C

6 months capped at -20 °C (± 5 °C)

Specimens can be repeatedly frozen and thawed up to 3 times.

Invert thawed specimens several times prior to testing.

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.[12]

For prolonged storage, freezing of the sample is recommended.[12]

Freeze only once.

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*.[13]

Centrifuge highly turbid specimens or samples containing precipitates before performing the assay.

See the limitations and interferences section for details about possible sample interferences.

CAUTION: Specimen dilutions should only be used to interpret results of Calc.? and Samp.? alarms, or when estimating concentration in preparation for GC-MS or LC-MS/MS. Dilution results are not intended for patient values. Dilution procedures, when used, should be validated.

Materials provided

See “Reagents – working solutions” section for reagents.

Materials required (but not provided)

See “Order information” section

General laboratory equipment

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.

The performance of applications not validated by Roche is not warranted and must be defined by the user.

Application for serum/plasma

Test definition

	Qualitative
Reporting time	10 min
Wavelength (sub/main)	– /505 nm
Reagent pipetting	
R1	31 µL
R2	31 µL
R3	27 µL
Sample volumes	*Sample*
200 ng/mL cutoff	
Normal	1.2 µL
Decreased	1.2 µL
Increased	1.2 µL

Application for urine

Test definition

	Semiquantitative	Qualitative
Reporting time	10 min	10 min
Wavelength (sub/main)	– /505 nm	– /505 nm
Reagent pipetting		Diluent (H_2O)
R1	31 µL	–
R2	31 µL	–
R3	27 µL	–
Sample volumes	*Sample*	*Sample dilution*
		Sample / *Diluent (NaCl)*
Normal	1.3 µL	– / –
Decreased	1.3 µL	– / –
Increased	1.3 µL	– / –

For further information about the assay test definitions refer to the application parameters setting screen of the corresponding analyzer and assay.

Calibration

Serum/plasma

Qualitative application

Calibrator	*200 ng/mL cutoff assay* S1: Preciset DAT Plus I, CAL 3
Cutoff calibrator	A value of "0" is encoded in the e-barcode in order to ensure flagging of positive samples with >Test and negative absorbance values for negative samples.
Calibration K factor	The K factor of -1000 is predefined in the application settings.
Calibration mode	Linear
Calibration frequency	Full calibration - after reagent lot change - as required following quality control procedures

Urine

Semiquantitative application

Calibrators	*200 ng/mL cutoff assay* S1-4: Preciset DAT Plus I, CAL 1-4 0, 100, 200, 400 ng/mL
Calibration mode	Non-linear
Calibration frequency	Full calibration - after reagent lot change - as required following quality control procedures

Qualitative application

Calibrators	*200 ng/mL cutoff assay* S1: C.f.a.s. DAT Qualitative Plus, C.f.a.s. DAT Qualitative Plus Clinical, or Preciset DAT Plus I, CAL 3
Cutoff calibrator	A value of "0" is encoded in the e-barcode in order to ensure flagging of positive samples with >Test and negative absorbance values for negative samples.
Calibration K factor	The K factor of -1000 is predefined in the application settings.
Calibration mode	Linear
Calibration frequency	Full calibration - after reagent lot change - as required following quality control procedures

The drug concentrations of the calibrators have been verified by GC-MS.

Calibration interval may be extended based on acceptable verification of calibration by the laboratory.

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

Quality control

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 the high and low controls have been verified by LC-MS/MS and of the Control Set DAT I and Clinical by GC-MS.

The control intervals and limits should be adapted to each laboratory’s individual requirements. It is recommended to perform quality control always after lot calibration and subsequently at least every 26 weeks.

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

For the qualitative assay, the cutoff calibrator is used as a reference in distinguishing between preliminary positive and negative samples. Samples producing a positive or “0” absorbance value are considered preliminary positive. Preliminary positive samples are flagged with with >Test. Samples producing a negative absorbance value are considered negative. Negative samples are preceded by a minus sign.

For the semiquantitative applications **cobas c** systems automatically calculate the drug or metabolite concentration of each sample in the unit ng/mL. Results equal to or greater than the respective cutoff value are considered preliminary positive. Concentration values below the respective cutoff indicate a negative result.

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: If a result of Calc.? or Samp.? alarm is obtained, review the Reaction Monitor data for the sample and compare with the Reaction Monitor data for the highest calibrator. The most likely cause is a high concentration of the analyte in the sample, in which case the absorbance value for the sample will be less than that of the highest calibrator. Make an appropriate dilution of the sample using the 0 ng/mL calibrator and rerun the sample. A normal drug-free urine may be substituted for the 0 ng/mL calibrator if the urine and procedure have been validated by the laboratory. To ensure that the sample was not over-diluted, the diluted result, prior to multiplying by the dilution factor, must be at least half the analyte cutoff value. If the diluted result falls below half the analyte cutoff value, 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 to interpret results of Calc.? or Samp.? alarms, or when estimating concentration in preparation for GC-MS or LC-MS/MS.

Use caution when reporting results as there are various factors that influence a urine test result, such as fluid intake and other biological factors.

As with any sensitive test for drugs of abuse on automated clinical chemistry analyzers, the possibility exists for analyte carry-over from a sample with an extremely high concentration to a normal (negative) sample which immediately follows it.

Preliminary positive results should be confirmed by another method.

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 barbiturates and/or their metabolites in serum or urine. It does not measure the level of intoxication.

Serum/plasma

Criterion: No cross-over at initial values of samples of 100 ng/mL and 300 ng/mL (control levels).

Icterus:[14] No significant interference up to an I index of 60 for conjugated and unconjugated bilirubin (approximate conjugated and unconjugated bilirubin concentration: 1026 µmol/L or 60 mg/dL).

Hemolysis:[14] No significant interference up to an H index of 1000 (approximate hemoglobin concentration: 622 µmol/L or 1000 mg/dL).

Lipemia (Intralipid):[14] No significant interference up to an L index of 1000. There is poor correlation between the L index (corresponds to turbidity) and triglycerides concentration.

Rheumatoid factors: No significant interference from rheumatoid factors up to a concentration of 1200 IU/mL.

Immunoglobulins: No significant interference from immunoglobulins up to a concentration of 16 g/L (simulated by human immunoglobulin A), up to a concentration of 70 g/L (simulated by human immunoglobulin G) and up to a concentration of 10 g/L (simulated by human immunoglobulin M).

Albumin: No significant interference from human serum albumin up to a concentration of 70 g/L.

Urine

Interfering substances were added to drug free urine at the concentration listed below. These samples were then spiked to 200 ng/mL using a secobarbital stock solution. Samples were tested on a **cobas c** 501 analyzer and the following results were obtained.

Substance	Concentration tested	% Barbiturates recovery
Acetone	1 %	97
Ascorbic acid	1.5 %	93
Bilirubin	0.25 mg/mL	98
Creatinine	5 mg/mL	100
Ethanol	1 %	100
Glucose	2 %	100
Hemoglobin	7.5 g/L	101
Human albumin	0.5 %	99
Oxalic acid	2 mg/mL	104
Sodium chloride	0.5 M	105
Sodium chloride	1 M	110
Urea	6 %	103

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

In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.[15]

ACTION REQUIRED

Special Wash Programming: The use of special wash steps is mandatory when certain test combinations are run together on **cobas c** systems. All special wash programming necessary for avoiding carry-over is available via the **cobas** link. The latest version of the carry-over evasion list can be found with the NaOHD/SMS/SCCS Method Sheet. For further instructions, refer to the operator's manual.

Expected values

Serum/plasma

Qualitative assay

Results of this assay distinguish preliminary positive (≥ 200 ng/mL) from negative samples only. The amount of drug detected in a preliminary positive sample cannot be estimated.

Urine

Qualitative assay

Results of this assay distinguish preliminary positive (≥ 200 ng/mL) from negative samples only. The amount of drug detected in a preliminary positive sample cannot be estimated.

Semiquantitative assay

Results of this assay yield only approximate cumulative concentrations of the drug and its metabolites (see "Analytical specificity" section).

Specific performance data

Representative performance data on the analyzers are given below. These data represent the performance of the analytical procedure itself.

Results obtained in individual laboratories may differ due to heterogenous sample materials, aging of analyzer components and mixture of reagents running on the analyzer.

Precision

Serum/plasma

Precision was determined using human samples and controls in accordance with the CLSI (Clinical and Laboratory Standards Institute) EP05-A3 requirements with repeatability (n = 84) and intermediate precision (2 aliquots per run, 2 runs per day, 21 days). Results for repeatability and intermediate precision were obtained on the **cobas c** 503 analyzer.

	Number tested	Correct results	Confidence level
Serum -75 %	84	84	> 95 % negative reading
ACQ-L	84	84	> 95 % negative reading
Cutoff serum	84	n.a.**	n.a.**
ACQ-H	84	84	> 95 % positive reading
Serum +75 %	84	84	> 95 % positive reading

**n.a. = not applicable

The data obtained on **cobas c** 503 analyzer(s) are representative for **cobas c** 303 analyzer(s) and **cobas c** 703 analyzer(s).

Urine

Precision was determined using human samples and controls in accordance with the CLSI (Clinical and Laboratory Standards Institute) EP05-A3 requirements with repeatability (n = 84) and intermediate precision (2 aliquots per run, 2 runs per day, 21 days). Results for repeatability and intermediate precision were obtained on the **cobas c** 503 analyzer.

Semiquantitative precision

Repeatability	*Mean ng/mL*	*SD ng/mL*	*CV %*
Urine -50 %	101	4.25	4.2
DAT1N	155	4.58	2.9
DATCN	153	5.02	3.3
Cutoff urine	207	5.09	2.5
DAT1P	265	6.35	2.4
DATCP	261	3.71	1.4
Urine +50 %	318	5.81	1.8
Intermediate precision	*Mean ng/mL*	*SD ng/mL*	*CV %*
Urine -50 %	101	5.11	5.1
DAT1N	155	5.48	3.5
DATCN	153	5.60	3.7
Cutoff urine	207	5.71	2.8
DAT1P	265	7.78	2.9
DATCP	261	4.58	1.8
Urine +50 %	318	6.70	2.1

Qualitative precision

	Number tested	Correct results	Confidence level
Urine -50 %	84	84	>95 % negative reading
DAT1N	84	84	>95 % negative reading
Cutoff urine	84	n.a.	n.a.*
DAT1P	84	84	>95 % positive reading
Urine +50 %	84	84	>95 % positive reading

*n.a. = not applicable

The data obtained on **cobas c** 503 analyzer(s) are representative for **cobas c** 303 analyzer(s) and **cobas c** 703 analyzer(s).

Accuracy

Serum/plasma

110 serum samples screened negative for barbiturates on a **cobas c** 501 analyzer were evaluated with the Barbiturates Plus assay on a **cobas c** 503 analyzer. 100 % of these normal serum samples were negative relative to a 200 ng/mL cutoff with the Barbiturates Plus assay on a **cobas c** 503 analyzer. 55 serum samples screened positive for barbiturates relative to the corresponding cutoff on a **cobas c** 501 analyzer were evaluated with the Barbiturates Plus assay on a **cobas c** 503 analyzer. At the 200 ng/mL cutoff, 100 % of the samples were positive on both the **cobas c** 501 analyzer and the **cobas c** 503 analyzer.

Barbiturates Plus correlation (cutoff = 200 ng/mL)			
		cobas c 501 analyzer	
		+	-
cobas c 503 analyzer	+	55	0
	-	0	110

109 serum samples screened negative for barbiturates on a **cobas c** 501 analyzer were evaluated with the Barbiturates Plus assay on a **cobas c** 303 analyzer. 100 % of these normal serum samples were negative relative to a 200 ng/mL cutoff with the Barbiturates Plus assay on a **cobas c** 303 analyzer. 55 serum samples screened positive for barbiturates relative to the corresponding cutoff on a **cobas c** 501 analyzer were evaluated with the Barbiturates Plus assay on a **cobas c** 303 analyzer. At the 200 ng/mL cutoff, 100 % of the samples were positive on both the **cobas c** 501 analyzer and the **cobas c** 303 analyzer.

Barbiturates Plus correlation (cutoff = 200 ng/mL)			
		cobas c 501 analyzer	
		+	-
cobas c 303 analyzer	+	55	0
	-	0	109

100 serum samples screened negative for barbiturates on a **cobas c** 503 analyzer were evaluated with the Barbiturates Plus assay on a **cobas c** 703 analyzer. 100 % of these normal serum samples were negative relative to a 200 ng/mL cutoff with the Barbiturates Plus assay on a **cobas c** 703 analyzer. 55 serum samples screened positive for barbiturates relative to the corresponding cutoff on a **cobas c** 503 analyzer were evaluated with the Barbiturates Plus assay on a **cobas c** 703 analyzer. At the 200 ng/mL cutoff, 100 % of the samples were positive on both the **cobas c** 503 analyzer and the **cobas c** 703 analyzer.

Barbiturates Plus correlation (cutoff = 200 ng/mL)			
		cobas c 503 analyzer	
		+	-
cobas c 703 analyzer	+	55	0
	-	0	100

Urine

100 urine samples, obtained from a clinical laboratory where they screened negative in a drug test panel, were evaluated with the Barbiturates Plus assay. 100 % of these normal urines were negative relative to a 200 ng/mL cutoff. 54 samples obtained from a clinical laboratory, where they screened preliminary positive with a commercially available immunoassay and were subsequently confirmed by GC-MS, were evaluated with the Barbiturates Plus assay. 100 % of these samples were positive relative to a 200 ng/mL cutoff. In addition, 10 samples were diluted to a barbiturate concentration of approximately 75-100 % of the cutoff concentration; and 10 samples were diluted to a barbiturate concentration of approximately 100-125 % of the cutoff concentration. Data from the accuracy studies described above that fell within the near cutoff value ranges were combined with data generated from the diluted positive urine samples. The following results were obtained with the Barbiturates Plus assay on the Roche/Hitachi 917 analyzer relative to the GC-MS values.

Barbiturates Plus clinical correlation (cutoff = 200 ng/mL)

		Negative samples	GC-MS values (ng/mL)		
			Near cutoff		Positive samples
			148-151	248-251	578- > 7500
Roche/Hitachi 917 analyzer	+	0	6	10	54
	-	100	4	0	0

110 urine samples screened negative for barbiturates on a **cobas c** 501 analyzer were evaluated with the Barbiturates Plus assay on a **cobas c** 503 analyzer. 100 % of these normal urines were negative relative to a 200 ng/mL cutoff with the Barbiturates Plus assay on a **cobas c** 503 analyzer. 55 urine samples screened positive for barbiturates relative to the corresponding cutoff on a **cobas c** 501 analyzer and subsequently confirmed by GC-MS, were evaluated with the Barbiturates Plus assay on a **cobas c** 503 analyzer. At the 200 ng/mL cutoff, 100 % of the samples were positive on both the **cobas c** 501 analyzer and the **cobas c** 503 analyzer.

Barbiturates Plus correlation (cutoff = 200 ng/mL)			
		cobas c 501 analyzer	
		+	-
cobas c 503 analyzer	+	55	0
	-	0	110

110 urine samples screened negative for barbiturates on a **cobas c** 501 analyzer were evaluated with the Barbiturates Plus assay on a **cobas c** 303 analyzer. 100 % of these normal urines were negative relative to a 200 ng/mL cutoff with the Barbiturates Plus assay on a **cobas c** 303 analyzer. 55 urine samples screened positive for barbiturates relative to the corresponding cutoff on a **cobas c** 501 analyzer and subsequently confirmed by GC-MS, were evaluated with the Barbiturates Plus assay on a **cobas c** 303 analyzer. At the 200 ng/mL cutoff, 100 % of the samples were positive on both the **cobas c** 501 analyzer and the **cobas c** 303 analyzer.

Barbiturates Plus correlation (cutoff = 200 ng/mL)			
		cobas c 501 analyzer	
		+	-
cobas c 303 analyzer	+	55	0
	-	0	110

100 urine samples screened negative for barbiturates on a **cobas c** 503 analyzer were evaluated with the Barbiturates Plus assay on a **cobas c** 703 analyzer. 100 % of these normal urines were negative relative to a 200 ng/mL cutoff with the Barbiturates Plus assay on a **cobas c** 703 analyzer. 55 urine samples screened positive for barbiturates relative to the corresponding cutoff on a **cobas c** 503 analyzer and subsequently confirmed by GC-MS, were evaluated with the Barbiturates Plus assay on a **cobas c** 703 analyzer. At the 200 ng/mL cutoff, 100 % of the samples were positive on both the **cobas c** 503 analyzer and the **cobas c** 703 analyzer.

Barbiturates Plus correlation (cutoff = 200 ng/mL)			
		cobas c 503 analyzer	
		+	-
cobas c 703 analyzer	+	55	0
	-	0	100

Analytical specificity

Serum/plasma

The specificity of this assay for some common barbiturates and structurally similar compounds 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 a 200 ng/mL secobarbital assay cutoff. The following results were obtained on a **cobas c** 501 analyzer.

BARB

ONLINE DAT Barbiturates Plus

Compound	ng/mL Equivalent to 200 ng/mL secobarbital	Approximate % cross-reactivity
Allobarbital	211	94.7
Amobarbital	466	42.9
Aprobarbital	193	104
Barbital	340	58.9
Butabarbital	326	61.4
Butalbital	350	57.2
Cyclopentobarbital	137	146
Pentobarbital	333	60.0
Phenobarbital	312	64.1
p-Hydroxyphenobarbital	590	33.9

Urine

The specificity of this assay for some common barbiturates and structurally similar compounds 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 a 200 ng/mL secobarbital assay cutoff. The following results were obtained on a Roche/Hitachi 917 analyzer.

Compound	ng/mL Equivalent to 200 ng/mL secobarbital	Approximate % cross-reactivity
Cyclopentobarbital	197	101
Aprobarbital	215	93
Butalbital	281	71
Allobarbital	282	71
Butabarbital	547	37
Pentobarbital	561	36
Amobarbital	702	29
Phenobarbital	925	22
p-Hydroxyphenobarbital	1039	19
Barbital	1750	11
1,3-Dimethylbarbituric acid	> 100000	0
Mephobarbital	> 100000	< 0.1
Barbituric acid	> 100000	< 0.01
Hexobarbital	> 100000	< 0.01
Diphenylhydantoin	> 500000	< 0.02
Glutethimide	> 500000	< 0.04

Drug interference

Serum/plasma

Interfering substances were added to serum containing secobarbital at -50 % and +50 % of the cutoff level at the concentration listed below. Samples were tested and the following results were obtained on a **cobas c** 501 analyzer.

Compound	Comp. conc. mg/L	Neg. level	Pos. level
Acetaminophen	200	neg	pos
Acetylcysteine	1660	neg	pos
Acetylsalicylic acid	1000	neg	pos
Amitriptyline	1.00	neg	pos
Ampicillin-Na	1000	neg	pos
Ascorbic acid	300	neg	pos
Caffeine	59.8	neg	pos
Cefoxitin	2500	neg	pos
Cyclosporine	5.00	neg	pos
Doxycycline	50.0	neg	pos
d-Pseudoephedrine	9.98	neg	pos
Erythromycin	59.9	neg	pos
Fenoprofen	195	neg	pos
Furosemide	59.9	neg	pos
Gentisic acid	18.0	neg	pos
Heparin	5000 U/L	neg	pos
Hydrochlorothiazide	6.02	neg	pos
Ibuprofen	500	neg	pos
Imipramine	0.70	neg	pos
Ketamine	10.0	neg	pos
Levodopa	20.0	neg	pos
Lidocaine	12.0	neg	pos
Methyldopa + 1.5 H_2O	20.0	neg	pos
Metronidazole	200	neg	pos
Naproxen	499	neg	pos
Phenylbutazone	400	neg	pos
Procaine	39.9	neg	pos
Promethazine	1.20	neg	pos
Quinidine	12.0	neg	pos
Quinine	48.0	neg	pos
Rifampicin	60.0	neg	pos
Tetracycline	15.1	neg	pos
Theophylline	100	neg	pos
Trifluoperazine	1.00	neg	pos

Urine

The following compounds were prepared in aliquots of pooled normal human urine to yield a final concentration of 100000 ng/mL. None of these compounds gave values in the assay that were greater than 0.012 % cross-reactivity.

Acetaminophen	Isoproterenol
Acetylsalicylic acid	Ketamine
Aminopyrine	Lidocaine
Amitriptyline	LSD
d-Amphetamine	MDA
l-Amphetamine	MDMA
Ampicillin	Melanin
Ascorbic acid	Meperidine
Aspartame	Methadone
Atropine	*d*-Methamphetamine
Benzocaine	*l*-Methamphetamine
Benzoylecgonine	Methaqualone
(cocaine metabolite)	Methylphenidate
Benzphetamine	Methyprylon
Caffeine	Morphine

Calcium hypochlorite	Naloxone
Chlordiazepoxide	Naltrexone
Chloroquine	Naproxen
Chlorpheniramine	Niacinamide
Chlorpromazine	Norethindrone
Cocaine	*l*-Norpseudoephedrine
Codeine	Nortriptyline
Desipramine	Oxazepam
Dextromethorphan	Penicillin G
Dextropropoxyphene	Phencyclidine
Diazepam	*β*-Phenethylamine
Diphenhydramine	Phenothiazine
Dopamine	Phentermine
Doxepin	Phenylbutazone
Ecgonine	*d*-Phenylpropanolamine
Ecgonine methyl ester	*d,l*-Phenylpropanolamine
d-Ephedrine	Procaine
d,l-Ephedrine	Promethazine
l-Ephedrine	*d*-Pseudoephedrine
Epinephrine	*l*-Pseudoephedrine
Erythromycin	Quinidine
Estriol	Quinine
Fenoprofen	Sulindac
Furosemide	Tetracycline
Gentisic acid	Δ^9 THC-9-carboxylic acid
Guaiacol glycerol ether	Tetrahydrozoline
Hydrochlorothiazide	Trifluoperazine
p-Hydroxyamphetamine	Trimipramine
Ibuprofen	Tyramine
Imipramine	Verapamil

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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.

Any serious incident that has occurred in relation to the device shall be reported to the manufacturer and the competent authority of the Member State in which the user and/or the patient is established.

Symbols

Roche Diagnostics uses the following symbols and signs in addition to those listed in the ISO 15223-1 standard:

CONTENT	Contents of kit
→	Volume for reconstitution
GTIN	Global Trade Item Number
Rx only	For USA: Caution: Federal law restricts this device to sale by or on the order of a physician.

CE 0123

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