

THC Rapid Test Cassette
(Whole Blood/Serum/Plasma)
Package Insert
REF DTH-402 English

A rapid test for the qualitative detection of Marijuana in human whole blood or serum or plasma.

For medical and other professional in vitro diagnostic use only.

INTENDED USE

The THC Rapid Test Cassette (Whole Blood/Serum/Plasma) is a lateral flow chromatographic immunoassay for the detection of Marijuana in whole blood or serum or plasma at a cut-off concentration of 35ng/mL. This test will detect other related compounds, please refer to the analytical specificity table in this package insert.

This assay provides only a qualitative, preliminary 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) is the preferred confirmatory method. Clinical consideration and professional judgment should be applied to any drug of abuse test result, particularly when preliminary positive results are used.

SUMMARY

THC (9-tetrahydrocannabinol) is the primary active ingredient in cannabis (marijuana). When smoked or orally administered, THC produces euphoric effects. Users have impaired short-term memory and slowed learning. They may also experience transient episodes of confusion and anxiety. Long-term, relatively heavy use may be associated with behavioral disorders. The peak effect of marijuana administered by smoking occurs in 20-30 minutes and the duration is 90-120 minutes after one cigarette. Elevated levels of urinary metabolites are found within hours of exposure and remain detectable for 3-10 days after smoking. The main metabolite excreted in the whole blood/serum/plasma is 11-nor-(9-tetrahydrocannabinol)-9-carboxylic acid (THC-COOH).

PRINCIPLE

The THC Rapid Test Cassette (Whole Blood/Serum/Plasma) is an immunoassay based on the principle of competitive binding. Drugs that may be present in the whole blood/serum/plasma specimen compete against the drug conjugate for binding sites on the antibody.

During testing, a whole blood/serum/plasma specimen migrates upward by capillary action. Marijuana, if present in the whole blood/serum/plasma specimen below the cut-off level, will not saturate the binding sites of the antibody in the test. The antibody coated particles will then be captured by immobilized Marijuana-protein conjugate and a visible colored line will show up in the test line region. The colored line will not form in the test line region if the Marijuana level exceeds the cut-off level because it will saturate all the binding sites of anti-Marijuana antibodies.

A drug-positive whole blood/serum/plasma specimen will not generate a colored line in the test line region because of drug competition, while a drug-negative whole blood/serum/plasma specimen or a specimen containing a drug concentration less than the cut-off will generate a line in the test line region. To serve as a procedural control, a colored line will always appear at the control line region indicating that proper volume of specimen has been added and membrane wicking has occurred.

REAGENTS

The test contains mouse monoclonal anti-Marijuana antibody coupled particles and Marijuana-protein conjugate. A goat antibody is employed in the control line system.

PRECAUTIONS

- For professional in vitro diagnostic use only. Do not use after the expiration date.
- Do not eat, drink or smoke in the area where the specimens or kits are handled.
- Do not use test if pouch is damaged.
- Handle all specimens as if they contain infectious agents. Observe established precautions against microbiological hazards throughout testing and follow the standard procedures for proper disposal of specimens.
- Wear protective clothing such as laboratory coats, disposable gloves and eye protection when specimens are being tested.
- The used test should be discarded according to local regulations.
- Humidity and temperature can adversely affect results.

STORAGE AND STABILITY

Store as packaged in the sealed pouch at room temperature or refrigerated (2-30°C). The test is stable through the expiration date printed on the sealed pouch. The test must remain in the sealed pouch until use. DO NOT FREEZE. Do not use beyond the expiration date.

SPECIMEN COLLECTION AND PREPARATION

- The THC Rapid Test Cassette can be performed using whole blood (from venipuncture or fingerstick) /serum/plasma.
- To collect **Fingerstick Whole Blood specimens**:
 - Wash the patient's hand with soap and warm water or clean with an alcohol swab. Allow to dry.

- Massage the hand without touching the puncture site by rubbing down the hand towards the fingertip of the middle or ring finger.
- Puncture the skin with a sterile lancet. Wipe away the first sign of blood.
- Gently rub the hand from wrist to palm to finger to form a rounded drop of blood over the puncture site.
- Add the Fingerstick Whole Blood specimen to the test by using **a capillary tube**:
 - Touch the end of the capillary tube to the blood until filled to approximately 40 µL.
 - Allow air bubbles.
 - Place the bulb onto the top end of the capillary tube, then squeeze the bulb to dispense the whole blood to the specimen well of the test cassette.
- Testing should be performed immediately after specimen collection. Do not leave the specimens at room temperature for prolonged periods. Serum and plasma specimens may be stored at 2-8°C for up to 3 days, for long-term storage, specimens should be kept below -20°C. Whole blood collected by venipuncture should be stored at 2-8°C if the test is to be run within 2 days of collection. Do not freeze whole blood specimens. Whole blood collected by fingerstick should be tested immediately.
- Bring specimens to room temperature prior to testing. Frozen specimens must be completely thawed and mixed well prior to testing. Specimens should not be frozen and thawed repeatedly.
- If specimens are to be shipped, they should be packed in compliance with local regulations covering the transportation of etiologic agents.

MATERIALS

- Test cassettes
- Materials Provided
 - Droppers
 - Buffer
 - Package insert
- Materials Required But Not Provided
 - Specimen collection containers
 - Centrifuge
 - Lancets (for fingerstick whole blood only)
 - Timer
 - Heparinized capillary tubes and dispensing bulb (for fingerstick whole blood only)

DIRECTIONS FOR USE

Allow the test, specimen, buffer and/or controls to reach room temperature (15-30°C) prior to testing.

- Bring the pouch to room temperature before opening it. Remove the test cassette from the sealed pouch and use it within one hour.
- Place the cassette on a clean and level surface.

For serum or plasma specimen:

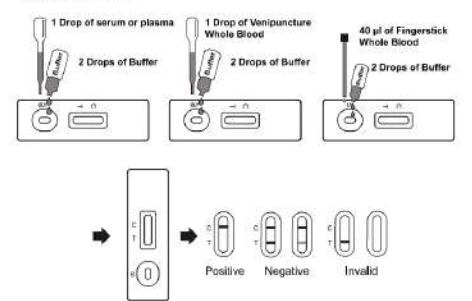
- Hold the dropper vertically and transfer 1 full drop of serum or plasma (approximately 40µL), then add 2 drops of buffer (approximately 80µL) to the specimen well(S) of the cassette, and then start the timer. Avoid trapping air bubbles in the specimen well. See illustration below.

For Venipuncture Whole blood specimen:

- Hold the dropper vertically and transfer 1 drop of whole blood (approximately 40µL) to the specimen well(S), then add 2 drops of buffer (approximately 80µL), and start the timer. See illustration below.

For Fingerstick Whole blood specimen:

- To use a capillary tube: Fill the capillary tube and transfer approximately 40µL of fingerstick whole blood specimen to the specimen well(S) of test cassette, then add 2 drops of buffer (approximately 80µL) and start the timer. See illustration below.
- Wait for the colored line(s) to appear. Read the result at 5 minutes. Do not interpret the result after 10 minutes.



52.5	+50%	30	0	30
105	3X	30	0	30

Analytical Specificity

The following table lists compounds that are positively detected in Whole Blood/Serum/Plasma by the THC Rapid Test Cassette (Whole Blood/Serum/Plasma) at 5 minutes.

Compound	Concentration (ng/mL)
Cannabidiol	25,000
11-nor-Δ ⁹ -THC-9 COOH	25
11-nor-Δ ⁸ -THC-9 COOH	35
Δ ⁹ -THC	12,000
Δ ⁸ -THC	12,000

Precision

A study was conducted at three hospitals using three different lots of product to demonstrate the within run, between run and between operator precision. An identical panel of coded specimens, containing no marijuana, and 50% marijuana above and below the 35ng/mL cut-off was provided to each site. The following results were tabulated:

THC Concentration (ng/mL)	n per Site	Site A		Site B		Site C	
		-	+	-	+	-	+
0	10	10	0	10	0	10	0
17.5	10	8	2	9	1	9	1
52.5	10	1	9	1	9	2	8

Cross-Reactivity

A study was conducted to determine the cross-reactivity of the test with compounds in either drug-free whole blood/serum/plasma or marijuana positive whole blood/serum/plasma. The following compounds show no cross-reactivity when tested with the THC Rapid Test Cassette (Whole Blood/Serum/Plasma) at a concentration of 100 µg/mL.

Non Cross-Reacting Compounds

4-Azetamidophenol	Deoxycorticosterone	(+)-3,4-Methylenedioxy-	Prednisolone
Acetophenetidin	Dextromethorphan	amphetamines	Prednisone
N-Acetylprocainamide	Diazepam	(+)-3,4-Methylenedioxy-	Procaine
Acetylsalicylic acid	Diclofenac	methamphetamine	Promazine
Aminopyrine	Diflunisal	Methylphenidate	Promethazine
Amitypyline	Digoxin	Methpyrton	D,l-Propanediol
Amobarbital	Diphenhydramine	Morphine-3-	D-Propoxyphene
Amoxicillin	Doxylamine	β-D-glucuronide	D-Pseudoephedrine
Ampicillin	Ecgonine hydrochloride	Nalidixic acid	Quinidine
l-Ascorbic acid	Ecgoninemethylester	Nalorphine	Quinine
D,l-Amphetamine	(-)-α-Ephedrine	Naloxone	Ranitidine
l-Amphetamine	Erythromycin	Naltrexone	Salicylic acid
Apomorphine	β-Estradiol	Naproxen	Secobarbital
Aspartame	Estrone-3-sulfate	Nicotinamide	Serotonin
		(5-Hydroxytryptamine)	
Atropine	Ethyl-p-aminobenzoate	Nifedipine	Sulfamethazine
Benzilic acid	Fenpropfen	Norcocaine	Sulindac
Benzoic acid	Furosemide	Norethindrone	Temazepam
Benzoyllecgonine	Geriatric acid	D-Norpropoxyphene	Tetracycline
Benzphetamine	Hemoglobin	Noscapine	Tetrahydrocortisone
Bilirubin	Hydralazine	D,l-Octopamine	3-Acetate
(α)-Brompheniramine	Hydrochlorothiazide	Oxalic acid	Tetrahydrocortisone
Caffeine	Hydrocodone	Oxazepam	3 (β-D-glucuronide)
Cannabidiol	Hydrocortisone	Oxolinic acid	Tetrahydrozoline
Chloralhydrate	O-Hydroxyhippuric acid	Oxycodone	Thebaine
Chloramphenicol	3-Hydroxytyramine	Oxymetazoline	Thiamine
Chlordiazepoxide	Ibuprofen	p-Hydroxy-	Thioridazine
Chlorothiazide	Imipramine	methamphetamine	D, l-Thyroxine
(l) Chlorpheniramine	Iproniazid	Papaverine	Tolbutamide
Chlorpromazine	(±)-Isoprenalolol	Penicillin-G	Triamterene
Chlorzoxiprine	Isoquinoline	Pentazocine	Trifluoperazine
Cholesterol	Ketamine	Pentobarbital	Trimethoprim
Clomipramine	Ketoprofen	Perphenazine	Trimipramine
Clonidine	labetalol	Phencyclidine	Tryptamine
Cocaine hydrochloride	levorphanol	Phenelzine	D, l-Tryptophan
Cocaine	loperamide	Phenobarbital	Tyramine
Cortisone	Maprotiline	Phenfermine	D, l-Tyrosine
(-)-Cotinine	Meprobamate	l-Phenylephrine	Uric acid

Interfering Substances

The THC Rapid Test Cassette (Whole Blood/Serum/Plasma) has been tested for possible

INTERPRETATION OF RESULTS

(Please refer to the illustration above)

NEGATIVE: Two colored lines appear. One colored line should be in the control line region (C) and another colored line should be in the test line region (T). This negative result indicates that the Marijuana concentration is below the detectable cut-off level.

NOTE: The shade of color in the test line region (T) may vary, but it should be considered negative whenever there is even a faint colored line.

POSITIVE: One colored line appears in the control line region (C). No line appears in the test line region (T). This positive result indicates that the Marijuana concentration exceeds the detectable cut-off level.

INVALID: Control line fails to appear. Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the procedure and repeat the test with a new test. If the problem persists, discontinue using the test kit immediately and contact your local distributor.

QUALITY CONTROL

A procedural control is included in the test. A colored line appearing in the control region (C) is the internal procedural control. It confirms sufficient specimen volume and correct procedural technique. Control standards are not supplied with this kit; however, it is recommended that positive and negative controls be tested as a good laboratory practice to confirm the test procedure and to verify proper test performance.

LIMITATIONS

- The THC Rapid Test Cassette (Whole Blood/Serum/Plasma) provides only a qualitative, preliminary result. A secondary analytical method must be used to obtain a confirmed result. Gas chromatography/mass spectrometry (GC/MS) is the preferred confirmatory method.²
- It is possible that technical or procedural errors, as well as other interfering substances in the whole blood or serum or plasma specimen may cause erroneous results.
- A positive result indicates presence of the drug or its metabolites but does not indicate level of intoxication, administration route or concentration in whole blood or serum or plasma.
- A negative result may not necessarily indicate drug-free Whole blood/serum/plasma. Negative results can be obtained when drug is present but below the cut-off level of the test.
- Test does not distinguish between drugs of abuse and certain medications.

Accuracy

A side-by-side comparison was conducted using the THC Rapid Test Cassette and GC/MS at the cut-off of 35ng/mL. Testing was performed on 90 clinical specimens previously collected from subjects present for Drug Screen Testing. The following results were tabulated:

Clinic Result of Whole Blood				
Method	GC/MS		Total Results	
	Results	Positive		
	Positive	24	1	25
THC Rapid Test Cassette	Negative	2	63	65
		26	64	90
Total Results		92.3%	98.4%	96.7%

Clinic Result of Serum or Plasma				
Method	GC/MS		Total Results	
	Results	Positive		
	Positive	24	1	25
THC Rapid Test Cassette	Negative	2	63	65
		26	64	90
Total Results		92.3%	98.4%	96.7%

Analytical Sensitivity

A drug-free whole blood/serum/plasma pool was spiked with Marijuana at the following concentrations of ±50% cutoff and 3x cutoff. The data are summarized below:

For whole blood:

THC Concentration (ng/mL)	Percent of Cut-off	n	Visual Result	
			Negative	Positive
0	0	30	30	0
17.5	-50%	30	30	0
35	Cut-off	30	15	15
52.5	+50%	30	0	30
105	3X	30	0	30












For serum or plasma:

THC Concentration (ng/mL)	Percent of Cut-off	n	Visual Result	
			Negative	Positive
0	0	30	30	0
17.5	-50%	30	30	0
35	Cut-off	30	15	15

interference from visibly hemolyzed and lipemic specimens. In addition, no interference was observed in specimens containing up to 100 mg/dL hemoglobin; up to 100 mg/dL bilirubin and up to 200 mg/dL human serum albumin.

BIBLIOGRAPHY

- Tietz NW. *Textbook of Clinical Chemistry*. W.B. Saunders Company. 1989; 1735
- Baselt RC. *Disposition of Toxic Drugs and Chemicals in Man*. 2nd Ed. Biomedical Publ., Davis, CA. 1982; 488

Index of Symbols					
	Consult Instructions For Use		Tests per kit		Authorized Representative
	For <i>in vitro</i> diagnostic use only		Use by		Do not reuse
	Store between 2-30 °C		Lot Number		Catalog #
	Do not use if package is damaged		Manufacturer		

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