Revised 24 Feb. 2010 rm (Vers. 2.0) **USA: RUO**

Please use only the valid version of the package insert provided with the kit.

INTENDED USE

The **Troponin I Rapid Test** is a rapid one-step chromatographic immunoassay for the qualitative detection of human cardiac Troponin I in whole blood, serum or plasma as an aid in the determination of myocardial infarction (MI).

SUMMARY

Cardiac Troponin I (cTnl) is a protein found in cardiac muscle with a molecular weight of 22.5 kDa.[1] Troponin I is part of a three subunit complex comprising of Troponin T and Troponin C. Along with tropomyosin, this structural complex forms the main component that regulates the calcium sensitive ATPase activity of actomyosin in striated skeletal and cardiac muscle.[2] After cardiac injury occurs, cTnI is released into the blood 4-6 hours after the onset of pain. The release pattern of cTnl is similar to CK-MB, but while CK-MB levels return to normal after 72 hours, cTnI levels remain elevated for 6-10 days, thus providing a longer window of detection for cardiac injury. The high specificity of cTnl measurements for the identification of myocardial damage has been demonstrated in conditions such as the perioperative period, after marathon runs, and blunt chest trauma.[3] cTnl release has also been documented in cardiac conditions other than acute myocardial infarction /AMI) such as unstable angina, congestive heart failure, and ischemic damage due to coronary artery bypass surgery.[4] Because of its high specificity and sensitivity in the myocardial tissue, cTnI has recently become the most preferred biomarker for myocardial infarction.[5]

The Troponin I Rapid Test is a simple test that utilizes a combination of particle conjugated anti-cTnl antibodies and capture reagent to selectively detect cTnl in whole blood, serum or plasma. The minimum detection level is 1.0 ng/mL.

PRINCIPLE

The Troponin I Rapid Test is a qualitative, membrane based immunoassay for the detection of cTnl in whole blood, serum or plasma.

The membrane is pre-coated with capture reagent on the test line region of the test. During testing the Troponin I in the whole blood, serum or plasma specimen reacts with two specific anti-cTnl antibodies. One of the antibodies mediates binding to the capture reagent, the other antibody is color labelled.

The mixture migrates upward on the membrane by capillary action. In the test line region the cTnI-antibody complex is captured by the immobilised capture reagent so that a red line is generated. The presence of a red line in the test line region indicates a positive result.

If the sampled does not contain cTnI no line will form in the test result line region indicating a negative result.

In addition a red line must form in the control line region (C) independent of the cTnI concentration in the sample. The control line serves as a procedural control and indicates that sufficient volume of specimen has been added and membrane wicking has occurred.

PRECAUTIONS

- For single professional in vitro use only.
- Do not use after the expiration date.
- The test device should remain in the sealed pouch until use.
- Do not eat, drink or smoke in the area where the specimens or kits are handled.
- Do not use if pouch is damaged.

- Dispose the used test device according to the local regulations
- Humidity and temperature can adversely affect results.
- All specimen might be potentially infectious. Proper handling and disposal methods should be established.
- Wear protective clothing such as laboratory coats, disposable gloves and eye protection when specimens are being tested.

STORAGE AND STABILITY

Store as packaged in the sealed pouch at room temperature (2-30°C / 36-86 °F). The Troponin I Test is stable until the expiration date printed on the sealed pouch. The test device must remain in the sealed pouch until use.

- Do not freeze.
- Do not use beyond the expiration date.

SPECIMEN COLLECTION AND PREPARATION

The Troponin I Rapid Test can be performed using whole blood (from venipuncture or fingerstick), serum or plasma.

Whole blood from fingertip:

- Wash the hand of the patient with soap and warm water or clean the puncture site thoroughly with alcohol.
- Massage the hand in direction of the fingertip of the middle finger or ring finger without touching the puncture.
- Prick the fingertip with a sterile lancet. Wipe the first drop of blood.
- Rub the hand from the wrist to the palm and to the finger to form a round drop at puncture.

Collection of whole blood from fingertip **using a capillary**:

- Take a blood sample filling the capillary with 120 µl of the sample. Avoid air pockets.
- Put the dispensary bulb at the top of the capillary and press it to dribble blood sample in the specimen well (S) of the test device.

Dispensary of whole blood from fingertip by **hanging drops**:

- Position the finger of the patient exactly above the specimen well (S) of the test device.
- Drop 2-(3) hanging drops of whole blood from the puncture of the finger into the specimen well (S). The finger of the patient can be moved over the specimen well so that the drop has contact with the well. A direct contact of the finger and the specimen well should be avoided.

General comments

- Separate serum or plasma from blood as soon as possible to avoid hemolysis.
- Heparin, EDTA or citrate blood can be used for the plasma extraction.
- Use only clear, non-hemolyzed specimens.
- 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. Whol e 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 fingertip 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

MATERIALS PROVIDED

- 20 Test devices
- Disposable pipettes (inside pouch)
- Package insert

MATERIALS REQUIRED BUT NOT PROVIDED

- Tubes for taking blood samples
- Centrifuge (for plasma / serum)
- Heparinised capillaries and dispensary bulb (only for whole blood from fingertip)
- Lancets (only for whole blood from fingertip)
- Timer

TESTING PROCEDURE

1. Allow the Troponin I Rapid Test device, specimen, and/or controls to equilibrate to room temperature (15-30°C / 59-86 °F) prior to testing.

2. Remove the test device from the sealed pouch and use it as soon as possible. Best results will be obtained if the assay is performed within one hour.
   Place the test device on a clean and level surface.

3 a. **Serum or plasma or venipuncture blood**
   Hold the provided pipette vertically and transfer **3 drops of serum or plasma** (ca. 120 µl) into the round specimen well (S) of the Troponin I Rapid Test

3 b. **Venipuncture Whole Blood**
   Hold the provided pipette vertically and transfer **3 drops** (ca. 120 µl) **of whole blood** into the round specimen well (S) of the Troponin I Rapid Test.

3 c. **Fingerstick Whole Blood**
   Transfer 2-(3) hanging drops of whole blood from the fingertip puncture / or approximately 120 µl whole blood from the heparinised capillary into the round specimen well (S) of Troponin I Rapid Test

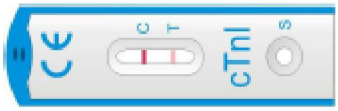
4. Start the timer. Wait for the red line(s) to appear. The result should be read **at 10 minutes**.
   Please confirm negative test results after 20 minutes. Do not read results after more than 20 minutes.

INTERPRETATION OF RESULTS

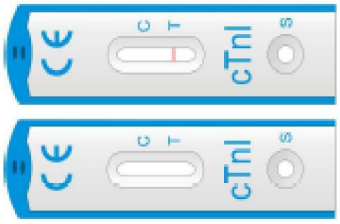
Negative: **One red line appears in the control line region (C).** No apparent red line appears in the test line region (T).

Positive*: **Two distinct red lines appear.** One line forms in the control line region (C) and another line forms in the test line region (T).

IMPORTANT NOTICE: The colour of the test line (T) will vary in dependence of the cTnI concentration, even a very faint pinkish line must be interpreted as a positive result.



Invalid: **The control line (C) is not formed.** In this case the result is invalid even if the test result is visible. Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the test procedure and repeat the assay with a new test device. If the problem persists, discontinue using the test kit immediately and contact you local distributor.



*Note: The intensity of the red color in the test line region (T) will vary depending on the concentration of cTnI present in the specimen. Therefore, also faint reddish test result lines (T) should be considered positive.

QUALITY CONTROL

As internal procedural control the Troponin I Rapid Test includes the control line. It is only formed if sufficient specimen volume has been added and the chromatography has been finished successfully.
Control standards are not supplied with this kit; yet, we recommend that positive and negative controls should be tested as a good laboratory practice to confirm the test procedure and to verify proper test performance.

LIMITATIONS

1. The Troponin I Rapid Test is an in vitro device for professional use only. The test should be used for the detection of cTnI in whole blood, serum of plasma specimens. The Troponin I Rapid Test only allows a qualitative detection of cTnI; quantitative determinations cannot be made with this test.
2. The Troponin I Rapid Test will only indicate the presence of cTnI in the specimen and should not be used as the sole criteria for the diagnosis of myocardial infarction. . *From a fundamental point of view, rapid tests are not suited as a final criterion for the judgement of the status of a patient.*
3. Due to the heterogeneity of commercially available standard materials the sensitivity of the assay might vary slightly with different standard preparations However, a sensitivity of 1 ng/ml is always reached. Concentrations below 0.5 ng cTnI/ml cannot be detected with the Troponin I Rapid Test.
4. As with all diagnostic tests, all results must be interpreted together with other clinical information available to the physician. *A negative result does not exclude the possibility of myocardial infarction at any time.*
5. Some specimens containing unusually high titres of heterophile antibodies or rheumatic factor (RF) may affect the test result. Even if the test results are positive, further clinical evaluation should be considered with other clinical information available to the physician.

6. It is possible that the test does not yield any results if whole blood specimens have a high viscosity or if the whole blood specimens have been stored for more than 2 days. In this case the test should be repeated with a new test card using a plasma or serum specimen of the same patient.
7. False negative test results: In rare cases, autoantibodies can prevent the antigen-antibody reaction in the blood of the patient during the test. This can lead to false negative test results. Please note that this problematic can generally occur with all test methods involving the detection of a protein via an antibody reaction

Test PERFORMANCE

Analytical sensitivity

The detection limit of the test is 1.0 ng cTnI/ml. The standard materials from Hytest (free cTnl) are used for the regular testing of the minimum sensitivities. Please note that, due to the heterogeneity of commercially available standard materials, the sensitivity of the test can vary slightly when using different standards.

The performance of the Troponin I Rapid Test has been compared with a commercially available test accredited for the sale in the EU of another manufacturer. The results of the study demonstrated an overall accuracy of >99 % for the tested specimens. Specimen without cTnI consistently yielded negative results with both test. Specimen with cTnI-concentrations above the detection limit showed positive results with both assays.

Intra- and inter-lot-variance

The intra- and inter-lot-variance has been determined for 3 independent lots. cTnl specimen at concentrations of 0 ng/ml, 5 ng/ml, 10 ng/ml, 20 ng/ml, and 40 ng/ml were tested in a 10fold determination with each lot. The specimens were correctly identified >99% of the time.

Reproducibility

The reproducibility has been determined by 3 independent assays on the same five specimens: 0 ng/ml, 5 ng/ml, 10 ng/ml, 20 ng/ml, and 40 ng/ml cTnI. Three different lots of the Troponin I Rapid Test have been tested over a 3-month period using these specimens. The specimens were correctly identified >99% of the time.

Cross-Reactivity

Sera containing known amounts of cTnl antigen have been tested with 10,000 ng/ml Skeletal Troponin I, 2,000 ng/ml Troponin T, and 20,000 ng/ml Cardiac Myosin. No cross-reactivity was observed, indicating that Troponin I Rapid Test has a high degree of specificity for cardiac Troponin I (cTnI).
The Troponin I Rapid Test has been tested and no interference was observed in specimens containing 110 µg/ml human albumin, 6 mg/ml bilirubin, 1 mg/ml haemoglobin, 100 µg/ml cholesterol and 10 mg/ml triglycerides.
The following drugs have also been tested using Troponin I Rapid Test. No interference was observed at a concentration of 50 µg/ml.

Acetaminophen	Captopril	Hydrochloride	Pentoxifyline
Acetylsalicylic acid	Chloramphanicol	Furosemide	Phenobarbital
Anisodamine	Chlordiazepoxide	Hydrochlorothiazide	Quinine
Ascorbin Acid	Cilazapril	Isosorbide Mononitrat	Ramipril
Atenolol	Diclofenac	Labetalol	DL-Tyrosine
Atorvastatin	Digoxin	Metoprolol Tartrate	Trimethoprim
Calcium	Erythromycin	Moracizine	Verapamil
Bisoprolol Fumerate	Felodipine	Nifedipine	
Caffeine	Flunarizine	Oxazepam	

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4. Hossein-Nia M, et al. *Cardiac troponin / release in heart transplantation*. Ann.Thorac. Surg. 61 : 227 (1996).
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Symbols used with DRG Assays

Symbol	English	Deutsch	Français	Español	Italiano
	Consult instructions for use	Gebrauchsanweisung beachten	Consulter les instructions d'utilisation	Consulte las instrucciones de uso	Consultare le istruzioni per l'uso
CE	European Conformity	CE-Konfirmitäts-kennzeichnung	Conformité aux normes européennes	Conformidad europea	Conformità europea
IVD	In vitro diagnostic device	In-vitro-Diagnostikum	Usage Diagnostic in vitro	Para uso Diagnóstico in vitro	Per uso Diagnostica in vitro
RUO	For research use only	Nur für Forschungszwecke	Seulement dans le cadre de recherches	Sólo para uso en investigación	Solo a scopo di ricerca
REF	Catalogue number	Katalog-Nr.	Numéro de catalogue	Número de catálogo	Numero di Catalogo
LOT	Lot. No. / Batch code	Chargen-Nr.	Numéro de lot	Número de lote	Numero di lotto
	Contains sufficient for <n> tests/	Ausreichend für "n" Ansätze	Contenu suffisant pour "n" tests	Contenido suficiente para <n> ensayos	Contenuto sufficiente per "n" saggi
	Storage Temperature	Lagerungstemperatur	Température de conservation	Temperatura de conservación	Temperatura di conservazione
	Expiration Date	Mindesthaltbarkeits-datum	Date limite d'utilisation	Fecha de caducidad	Data di scadenza
	Legal Manufacturer	Hersteller	Fabricant	Fabricante	Fabbricante
Distributed by	Distributor	Vertreiber	Distributeur	Distribuidor	Distributore
Content	Content	Inhalt	Conditionnement	Contenido	Contenuto
Volume/No.	Volume / No.	Volumen/Anzahl	Volume/Quantité	Volumen/Número	Volume/Quantità

Symbol	Portugues	Dansk	Svenska	Ελληνικά
	Consulte as instruções de utilização	Se brugsanvisning	Se bruksanvisningen	Εγχειρίδιο χρήστη
CE	Conformidade com as normas europeias	Europaeisk overensstemmelse	Europeisk överensstämmelse	Ευρωπαϊκή Συμμόρφωση
IVD	Diagnóstico in vitro	In vitro diagnostik	Diagnostik in vitro	in vitro διαγνωστικό
RUO				
REF	Catálogo n.º	Katalognummer	Katalog nummer	Αριθμός καταλόγου
LOT	No do lote	Lot nummer	Batch-nummer	Αριθμός Παρτίδος
		Indeholder tilsttrækkeligt til "n" test	Innehåller tillräckligt till "n" tester	Περιεχόμενο επαρκές για «n» εξετάσεις
	Temperatura de conservação	Opbevarings-temperatur	Förvaringstempratur	Θερμοκρασία αποθήκευσης
	Prazo de validade	Udløbsdato	Bäst före datum	Ημερομηνία λήξης
	Fabricante	Producent	Tillverkare	Κατασκευαστής
Distributed by				
Content	Conteúdo	Indhold	Innehåll	Περιεχόμενο
Volume/No.	Volume/Número	Volumen/antal	Volym/antal	Όγκος/αριθ..