

# PTS PANELS™ Cholesterol Test Strips

## for use with CardioChek™ Brand Analyzers

### INTENDED USE

PTS PANELS Cholesterol Test Strips provide a quantitative measurement of total cholesterol in whole blood. This testing system is intended to measure total cholesterol for the diagnosis and treatment of disorders involving excess cholesterol in the blood or for lipid and lipoprotein metabolism disorders. This system is intended for in-home (self-testing) or professional use.

### SUMMARY

Cholesterol is an important substance used by the body in the manufacture of certain hormones and in cell walls. Elevated cholesterol is a risk factor for coronary artery disease. A MEMo Chip™ is provided with each package of test strips and must be properly inserted into the analyzer before any test can be run. The MEMo Chip contains test name, calibration curve, lot number and test strip expiration date. After the test strip is inserted into the analyzer and blood applied to the strip, test results are displayed in about a minute.

### PRINCIPLES OF THE TEST

Cholesterol test results are based on a reading of light reflected off a test strip that has changed color after blood is applied. The deeper the color is, the higher the cholesterol level. The analyzer converts this reading into a cholesterol result and displays it. This procedure is based on the "Trinder Method" for the determination of total cholesterol.

### MATERIALS PROVIDED

- PTS PANELS Cholesterol Test Strips
- MEMo Chip (contains lot-specific test strip information)
- Instructions

### MATERIALS NEEDED BUT NOT PROVIDED

- CardioChek brand analyzer
- Quality Control Materials
- Lancets for fingerstick (or venous blood collection supplies)
- Alcohol wipes and/or gauze
- Capillary Blood Collector or other precision pipet for blood collection and application

### CHEMICAL COMPOSITION

Each Cholesterol Test Strip contains the following active ingredients:

Cholesterol Esterase (Microorganism) . . . . .	≥ 0.75 I.U.
Cholesterol Oxidase (Microorganism) . . . . .	≥ 0.5 I.U.
4-aminoantipyrine . . . . .	≥ 12 µg
Peroxidase (Horseradish) . . . . .	≥ 1 I.U.
Substituted aniline derivatives . . . . .	≥ 30 µg

Each vial contains not more than 5 g silica gel desiccant.

### STORAGE AND HANDLING

- Store test strip package in a cool, dry place at room temperature of 68-86°F (20-30°C). Strips may be stored in a refrigerator at 35-46°F (2-8°C), but must be brought to room temperature before using. Do not freeze.
- Keep away from heat and direct sunlight.
- Do not remove or discard the desiccant packet in the vial.
- Always replace vial cap immediately after removing a test strip.
- Use test strip as soon as you have removed it from the vial.
- Keep the MEMo Chip either in the analyzer or stored with the original lot of strips.
- Store the test strips in the original vial. Do not combine with other strips and do not store the MEMo Chip in the test strip vial.
- After opening, the test strips are stable until expiration date if vial is properly stored and always capped.

### PRECAUTIONS

- For *in vitro* diagnostic use. Intended for self-testing.
- PTS PANELS Test Strips can only be used in the CardioChek brand analyzer.
- Make sure the MEMo Chip and test strip lot numbers match. Never use a MEMo Chip from a different lot than the test strip.
- Out-of-date or expired strips cannot be used in your test system. Check vial for expiration date.
- Add all of the blood to the test strip at once. If you do not get all of the blood on the strip, do not add blood to the same strip. Test again with a new unused test strip and fresh blood sample.
- Discard test strip after using. Strips are to be read once. Never insert or read a used test strip.
- **Do not ingest.**

### SPECIMEN COLLECTION AND PREPARATION

PTS PANELS Test Strips are designed for use with fresh capillary (fingerstick) whole blood. Fresh venous whole blood collected in EDTA or heparin tubes is also an acceptable sample. To obtain a drop of blood from a fingerstick, follow the steps below:

- Use of lotions and handcreams should be avoided before testing.
- Hands should be washed in warm water with antibacterial soap, rinsed and dried thoroughly.
- If you wipe the fingertip with alcohol, be sure that the alcohol dries completely before sticking the finger.
- Use a sterile, disposable lancet to puncture the side of the finger.
- Wipe away the first drop of blood with a clean piece of gauze.
- Gently, without force, apply pressure to the fingertip to accumulate a drop of blood.
- Excessive squeezing of the finger may alter test results.
- See the "TESTING" section for information on how to apply the blood to the test strip.
- Discard used materials properly.

**Caution: Handle and dispose of all materials coming in contact with blood according to universal precautions and guidelines.**

### TESTING

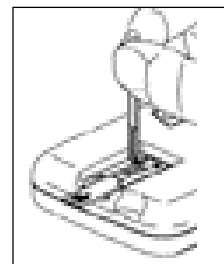
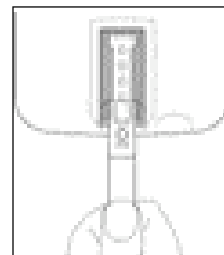
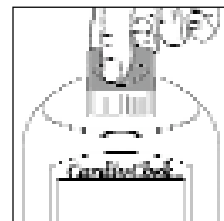
**IMPORTANT: Read all instructions carefully before testing.**

1. Insert the MEMo Chip that matches the lot number on the test strip vial and press one of the buttons to turn the analyzer ON.
- 2.\* Hold the test strip by the end with the horizontal raised lines. Insert the opposite end of the strip into analyzer. Push the strip in as far as it will go.
3. When APPLY SAMPLE appears on the display, use a capillary blood collector or pipet to apply 15 µL of whole blood to the test strip blood application window.
4. In about a minute, the result will appear on the display. Remove and discard strip. DO NOT add more blood to a test strip that has been used.

Ribs that guide the strip into the analyzer

Blood application window

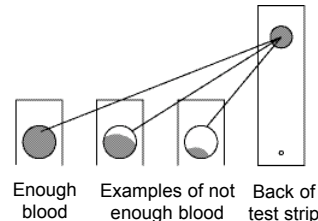
Hold strip by this end



\* As an alternative, the test strip may be inserted into the analyzer within 10 seconds AFTER blood is applied to the strip, when blood is applied to the strip directly from a finger. Touch a drop of blood hanging from the finger to the blood application window of the test strip. The blood drop must fill the entire window. Insert the strip into the analyzer. In about a minute, read result.

### ADDITIONAL CONSIDERATIONS

1. If no result is displayed, make sure:
  - Enough blood was added to the test strip to completely fill the blood application window.
  - Analyzer is ON. (If it won't turn ON, refer to analyzer User Guide section on changing batteries.)
  - MEMo Chip is properly installed in port.
2. If you get a reading of "LOW", "< \_\_\_", "HIGH", "> \_\_\_" or any unexpected result, test again.
3. See analyzer User Guide Troubleshooting section for additional help.
4. To verify enough blood has been applied to the test strip, remove strip after testing and check back side of reaction area. Reaction area should be completely and evenly colored. If the area is not completely and evenly colored, discard the used test strip and test again.



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 San Diego, CA 92121  
 tel 858-481-5031  
 toll free 888-882-7739  
 www.cliawaived.com

## TEST RESULTS

Results are displayed in either milligrams per deciliter (mg/dL) or in millimoles per liter (mmol/L). The mg/dL measurement is a US version, while mmol/L is used in many countries around the world. The analyzer is preset to US units by the manufacturer. No calculation of results is necessary. To change to INTL (mmol/L) units, please see the analyzer User Guide.

## QUALITY CONTROL

Please refer to the analyzer User Guide for the proper procedure and materials to be used to perform Quality Control tests. Quality Control tests are used to ensure that the system (analyzer, strips, and MEMo Chip) is working properly. Users should run controls when results are questionable or to comply with their own facility's quality control requirements.

## EXPECTED VALUES

Blood cholesterol levels will vary from time to time depending on food consumed, activity levels, health status, medication dosages, stress or exercise.

The expected or reference ranges recommended are as follows from the US National Cholesterol Education Program (NCEP) 2001 Guidelines:<sup>7</sup>

Cholesterol (Total) Expected Values

- Below 200 mg/dL (5.18 mmol/L) – desirable
- 200-239 mg/dL (5.18-6.20 mmol/L) – borderline to high
- 240 mg/dL (6.21 mmol/L) and above – high

A healthcare professional will discuss values that are specifically appropriate for each patient. At least two measurements of cholesterol on separate occasions should be made before a medical decision is made, since a single reading may not be representative of a patient's usual cholesterol concentration. An elevated cholesterol level is only one risk factor for heart disease. There are many others. A cholesterol level less than 200 mg/dL is desirable. ALWAYS CONSULT A HEALTHCARE PROFESSIONAL BEFORE MAKING ANY CHANGES IN TREATMENT PLANS OR MEDICATION.

## MEASURING RANGE

The cholesterol test system will detect cholesterol levels from 100-400 mg/dL (2.59-10.36 mmol/L) and will display a number value for results in this range. If the display reads "LOW" or "< \_\_\_" (less than measuring range), the cholesterol level is below 100 mg/dL (2.59 mmol/L). Results above 400 mg/dL (10.36 mmol/L) will read "HIGH" or "> \_\_\_" (greater than measuring range). If a "LOW", "HIGH", "<" or ">" result is displayed, always test again.

## LIMITATIONS OF THE PROCEDURE

1. PRESERVATIVES: Blood samples preserved with Fluoride or Oxalate should not be used for testing with this system. EDTA and Heparin do not interfere with the test. Fingertick whole blood is the specimen of choice.
2. NEONATAL USE: This product has not been tested using neonatal blood. Until testing is done this test system should not be used on neonatal blood samples.
3. METABOLITES: Reducing substances such as Vitamin C may falsely decrease the test result.
4. HEMATOCRIT: Hematocrit values above 50% or lower than 30% may incorrectly lower the cholesterol result.
5. Bilirubin up to 20 mg/dL and hemoglobin up to 200 mg/dL do not interfere.

## PERFORMANCE CHARACTERISTICS

1. ACCURACY: A clinical study was performed by healthcare professionals who measured cholesterol levels on fresh capillary blood specimens from 125 persons. The results below show that the Cholesterol Test Strips compare well to a reference cholesterol method that is correlated to the "Abell-Kendall Method". The performance of the Cholesterol Test Strips have been determined by a network laboratory (Cholesterol Reference Method Laboratory Network) to meet both accuracy and precision requirements recommended by the NCEP. This certification is issued through the Centers for Disease Control.

PTS PANELS Cholesterol vs. Reference Method

Number of patients = 125

slope = 1.01

y-intercept = -1.83

r = 0.91

Two hundred three (203) persons stuck their own finger and tested their cholesterol. In these studies 4.4%, or 9 patients obtained false negative (incorrectly low results). About 23% of the patients obtained results that were incorrectly high (false positives).

2. PRECISION: Twenty replicates of various levels of whole blood were tested for cholesterol. The following results were obtained:

No. of Samples	20	20	20	20
Mean Cholesterol Conc. (mg/dL)	105	154	230	262
Std. Deviation (mg/dL)	2.54	3.72	6.61	7.67
Coefficient of Variation (%)	2.42	2.41	2.88	2.92

This means that the variation between strips is less than 3%.

3. INTERFERENCES: See LIMITATIONS section.

## AVAILABILITY

REF/CAT NO.	DESCRIPTION
1711	PTS PANELS Cholesterol Test Strips – 25 Tests
1712	PTS PANELS Cholesterol Test Strips – 6 Tests
1790	PTS PANELS Cholesterol Test Strips – 3 Tests
730/1709	CardioChek Analyzer
1708	CardioChek P•A Analyzer
0721	PTS PANELS Multi-Chemistry Controls – Level 1 & Level 2

## CLIA INFORMATION (US only)

Complexity Categorization: Waived

## REFERENCES

1. Data on file.
2. Clinical Diagnosis and Management by Laboratory Methods, Eighteenth Edition, John Bernard Henry, Editor., W.B. Saunders Company, Philadelphia, 1991.
3. NCCLS Proposed Guideline EP6-P, Evaluation of the Linearity of Quantitative Analytical Methods. Villanova, PA: National Committee for Clinical Laboratory Standards, 1986.
4. NCCLS Tentative Guideline EP7-T. Interference Testing in Clinical Chemistry. Villanova, PA: National Committee for Clinical Laboratory Standards, 1986.
5. National Cholesterol Education Program. Report of expert panel on detection, evaluation, and treatment of high blood cholesterol in adults. National Heart, Lung and Blood Institute, NIH, Bethesda, MD. Arch. Int. Med., 148:36-69 (1988).
6. NCCLS. User evaluation of precision performance of clinical chemistry devices: tentative guidelines. 1984:2(1):1-48.EP5-T.
7. National Cholesterol Education Program. ATP III Guidelines At-A-Glance Quick Desk Reference. National Institutes of Health. National Heart, Lung and Blood Institute. NIH Publication No. 01-3305, May 2001.



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## Explanation of Symbols



Use By/  
Expiration date

**REF**

Catalog number



Batch Code/  
Lot number



Consult instructions for use



For in vitro diagnostic  
use



Manufacturer



This product fulfills the requirements of Directive 98/79/EC on in vitro diagnostic medical devices.



Store at/Temperature limitation