PT/INR Test Strips

Package Insert

REF C132-4011	English
MOEDL CCS-151	

INTENDED USE

Mission® PT/INR Test Strips are intended for use with the *Mission*® PT/INR Monitoring System to monitor blood clotting time in patients stabilized on Coumarin-type (e.g. warfarin) anticoagulation therapy. The *Mission*® PT/INR Test Strips use fresh capillary blood or fresh anticoagulant-free venous whole blood specimens. The results are reported in both Prothrombin Time and INR units. For *in vitro* diagnostic use only. The device is not intended to be used for screening purposes. For self testing and professional use.

SUMMARY

Oral anticoagulants are used to treat patients with atrial fibrillation, deep vein thrombosis (DVT), artificial heart valves, post myocardial infarctions and other cardiovascular disorders. These medications help to prevent blood clots, which can cause thromboembolic events such as stroke, recurrent myocardial infarction and pulmonary embolism. Warfarin, commonly known as *Coumadin*®[1] is frequently prescribed and acts by inhibiting the synthesis of vitamin K-dependent clotting factors. Oral anticoagulant drug actions tend to vary between different patients and are subject to change over time within a patient. Warfarin is a Narrow Therapeutic Index (NTI) drug which can be affected by factors such as drug interactions and dietary vitamin K.[2] As a result, periodic determination of INR is necessary for the individualized management of each patient's treatment. The INR system has become the standard quantitative measurement internationally because it corrects for variations among different instruments and reagents.

PRINCIPLE

The *Mission*® PT/INR Test Strips, when used as directed with the *Mission*® PT/INR Meter, will accurately and reliably measure International Normalized Ratio (INR) values and calculate Prothrombin Time (PT) in fresh capillary blood from a finger stick or fresh anticoagulant-free venous whole blood specimens. After inserting the test strip in the meter, the blood specimen is applied to the Specimen Application Area marked on the test strip. The meter detects the application of the specimen on the strip and initiates testing. The membrane of the strip contains the reagents necessary to begin the coagulation reaction. The time from the initial specimen detection to the fluorescent signal response is used to calculate the reported blood Prothrombin Time and INR value.

COMPOSITION

Each test strip contains the following reagents: 0.15% recombinant tissue factor, 0.2% calcium and buffer. Each individual test strip foil pouch contains a drying agent.

PRECAUTIONS

- All blood specimens and containers, capillary transfer tubes, lancets and materials that have come in contact with blood specimens should be handled as if capable of transmitting infectious diseases and discarded in a biohazardous waste container. Follow your facility's biohazard control guidelines.
- For *in vitro* use only. Do not take internally.
- Check the code chip before running a PT test. Make sure to use the code chip that is included with the box of strips in use. Insert the code chip into the code chip slot. The code chip slot is located on the right side of the meter.
- Do not add additional test specimen material after the initial specimen volume has been applied to the test strip.
- The specimen should cover the entire specimen well. A new test should be run if an insufficient specimen is applied.
- Do not apply strong repetitive pressure to the finger to get excessive blood specimen.
- It is not required that the first drop of blood be wiped away. However, the drop must be applied within 15 seconds of the finger stick.
- Do not use strips beyond the expiration date printed on the foil pouch of each strip.
- Venous whole blood collection must be done with an anticoagulant-free syringe.
- Current health status may affect test results and may cause unexpected or inaccurate results. Heath factors need to be taken into consideration when interpreting results, and decisions of medical relevance are not to be made without consulting a physician. Changes to treatment should only be made after professional consultation.

STORAGE AND HANDLING

- Test strips may be stored at or below room temperature, 2 °C to 30 °C (36 °F to 86 °F).
- If test strips are stored in the refrigerator, they must return to room temperature by sitting in a room temperature atmosphere in their own foil packaging for at least 15 minutes prior to use.
- The test strip should be used immediately upon removal from the foil pouch.
- Do not use the test strips beyond the expiration date printed on the foil pouch.

SPECIMEN COLLECTION AND PREPARATION

- Acceptable specimens include fresh capillary (finger stick) or fresh venous arm whole blood.
- Whole blood specimens must be tested immediately after collection.
- The minimum specimen volume is one hanging drop of capillary whole blood or 15μL of fresh venous whole blood.

MATERIALS

Materials Provided

- Test Strips
- Code Chip
- Package Insert

Materials Required But Not Provided

- PT/INR Meter
- Safety Lancets
- Control Solution
- Latex Gloves
- Gauze for Puncture Site
- Alcohol Swab
- Capillary Transfer Tubes (optional)

DIRECTIONS FOR USE

The *Mission*® PT/INR Test Strip uses either fresh capillary or fresh venous whole blood. Refer to the User's Manual for blood specimen collection before use.

1. Insert the code chip contained in the *Mission*® PT/INR Test Strip box into the *Mission*® PT/INR Meter as described in the User's Manual.
2. Open a foil pouch; Remove the test strip.
   Note: Each time before opening a test strip foil pouch, check the expiration date on the foil pouch. Do not use if the expiration date has passed.
3. Insert the test strip into the meter. The meter will automatically turn on and beep, if the sound is enabled. The meter will then go through a warm-up cycle. Check to ensure the displayed code number matches the number on the strip box. Select 'Blood' for a blood specimen, 'EC Tst' for an electronic control test, or 'CS Tst' for a liquid control specimen. When the meter displays the "ADD SPECIMEN" icon, prepare to collect the specimen.
4. Collect the blood specimen and apply the specimen to the *Mission*® PT/INR Test Strip according to the instructions in the User's Manual. The entire white circle in the center of the target area must be filled with one drop of blood. If the specimen well is only partially covered, repeat the test with a new strip.
5. Follow the displayed prompt to close the optics cover. The optics cover should be closed within 20 seconds of specimen application to the test strip.
6. The PT/INR meter will perform the test for about 2 minutes and "beep" when complete if the sound is enabled. Once complete, the meter will display the final INR value and Prothrombin Time if INR+PT is selected. Remove and discard the test strip. The meter will store the INR value in the memory, along with the date and time.
7. Carefully discard any materials that came in contact with blood according to proper biohazard control guidelines.

Note: Specimen may also be applied using a non-anticoagulated plastic capillary transfer tube.

EXPECTED VALUES

The *Mission*® PT/INR Monitoring System displays the results in the International Normalized Ratio (INR units). Normal Prothrombin Time results can vary from person to person, however; an INR of 1.0 usually corresponds to a normal value. Patients receiving anticoagulant therapy must be monitored carefully, with their physician establishing the appropriate INR range based upon the underlying clinical condition.

The *Mission*® PT/INR Monitoring System will display the following values when a test is completed:

INR Range	Display
INR < 0.7	INR ↓
0.7≤ INR ≤ 7.0	Measured INR Value
INR > 7.0	INR ↑

The recommended therapeutic range for warfarin is most commonly between INR 2 and 4 depending upon the underlying clinical condition.[3]

Normal Range

Normal PT levels, expressed as an INR, were determined for capillary whole blood collected from 120 healthy, warfarin-free individuals. Based upon the study performed, the reference INR range for the *Mission*® PT/INR Monitoring System is the following:

Specimen Type	95 % Range
Capillary Whole Blood	0.8 to 1.4

UNEXPECTED VALUES

Unexpected results may include results that fall outside the therapeutic range defined by the physician or results that fall within the therapeutic range but are associated with unusual clinical situations (such as abnormal symptoms of bleeding or bruising).

Possible causes for unexpected results:

- A hematocrit that is higher (above 60%) or lower (below 25%) than the validated operating range of the *Mission*® PT/INR Monitoring System. Hematocrit levels outside this range or severe anemia can cause inaccurate results.
- Severe, congenital or autoimmune hypofibrinogenemia, dysfibrinogenemia, hypoprothrombinemia or dysprothrombinemia, may cause patient results to differ from a clinical reference assay system.
- Conditions associated with elevated fibrinogen levels, such as inflammation, cancer, renal disease requiring haemodialysis and others.
- Receiving intravenous infusion therapy in the same arm from which a blood specimen is taken.
- Certain prescription or over-the-counter drugs (e.g. pain relievers) may affect the action of oral anticoagulants and the INR value.
- Lupus and other conditions that lead to the production of anti-phospholipid antibodies (APAs) may falsely prolong the INR level.[4]
- Changes in diet (e.g. taking nutritional supplements such as gingko biloba) and lifestyle may affect the action of oral anticoagulants and the INR value.

Upon receiving abnormal results or encountering unusual clinical conditions, please refer to a health care professional immediately and arrange for an alternative testing method.

PERFORMANCE CHARACTERISTICS

Measuring Range

The *Mission*® PT/INR Monitoring System has a numeric PT measuring range of 0.7 to 7.0 INR. Specimens below INR 0.7 are displayed as "INR ↓ ". Specimens above INR 7.0 are displayed as "INR ↑ ".

Verified Clinical Range. In clinical trials, patients were tested in the INR 0.7 to 7.0 range. Performance outside of this range has not been verified.

Sensitivity

The *Mission*® PT/INR Monitoring System is sensitive to deficiencies of Factors II, V, VII and X at the following levels (3 lot averages):

Factor II	Factor V	Factor VII	Factor X
25%	35%	42%	28%

Thromboplastin. The *Mission*® PT/INR Monitoring System uses recombinant human thromboplastin. The thromboplastin reagent has an approximate average International Sensitivity Index (ISI) of 1.0 as determined by the Sysmex CA-530 coagulation analyzer.

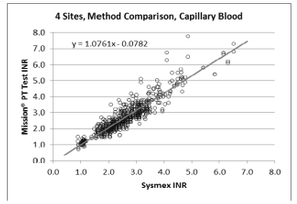
Accuracy

The *Mission*® PT/INR Monitoring System was compared against the *Sysmex*® analyzer, using human thromboplastin as a reference. The following accuracy data were obtained.

Capillary Whole Blood (INR)	Venous Whole Blood (INR)
Mission® PT/INR Monitoring System vs. Sysmex CA-530 Reference n = 605 Regression line: y = 1.061x - 0.044 r = 0.924	*Mission*® PT/INR Monitoring System vs. Sysmex CA-530 Reference n = 613 Regression line: y = 1.049x -0.083 r = 0.933

605 Capillary specimens were collected from 219 outpatients at four external sites. Capillary whole blood specimens were assayed on the *Mission*® PT/INR Meter with the *Mission*® PT/INR Test Strips, and venous specimens were measured on the Sysmex CA-530 Analyzer. The results are as follows:

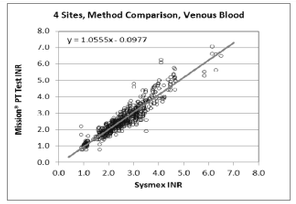
Capillary Whole Blood				
Site	**N**	**Slope**	**Intercept**	**R**
1	209	1.056	-0.075	0.965
2	184	1.091	-0.084	0.897
3	73	0.950	0.171	0.914
4	139	1.179	-0.274	0.882
All	605	1.061	-0.044	0.924



Capillary Data from All Sites: 605 Specimens from 219 patients

613 venous specimens were collected from 219 outpatients at four external sites. The INR of each specimen was compared to the INR of venous plasma specimens measured on the Sysmex CA-530 Analyzer. The results are as follows:

Venous Whole Blood				
Site	**N**	**Slope**	**Intercept**	**R**
1	211	1.040	-0.060	0.970
2	188	1.090	-0.163	0.908
3	77	0.937	0.044	0.932
4	137	1.159	-0.286	0.903
All	613	1.049	-0.083	0.933



Venous Data from All Sites: 613 Specimens from 219 patients

Precision

Precision studies were done using control solutions level 1 and level 2 on 3 lots of strips. The within-day precision study included 9 tests on 3 lots at 2 levels. Day-to-day precision included 2 tests, 2 runs per day for 20 days.

INR Scale	Within-Day 3 Strip Lots		Day-To-Day (Between Day) 3 Strip Lots	
	Level 1	Level 2	Level 1	Level 2
n	27	27	240	240
Mean	1.04	2.96	1.16	2.88
SD	0.05	0.11	0.01	0.03
CV	4.7%	3.8%	0.6%	1.0%

QUALITY CONTROL

Daily control testing is good laboratory practice and may be required in your location. Always check with the appropriate licensing or accrediting bodies to ensure your quality control program meets the established standards.

The recommended control solutions *Mission*® PT/INR Control Solution Level 1 and Level 2 should be tested when:

- A new shipment of test strips is received
- A new lot of test strips is opened
- Improper storage or handling of the test strips is suspected
- Patient PT results are unusually low or high

Control tests are performed in a very similar way to blood tests, using the commercially available liquid controls instead of blood. The User's Manual and Control Solution Insert should be read before using the controls. The system is working properly if the control value displayed by the meter is within the acceptable range for the control solution tested. The acceptable control range can be found on the pouch label. If the value is not acceptable, please contact your local distributor for assistance.

LIMITATIONS

- The following have no significant effect on test results:
  - Hematocrit ranges between 25% and 60%
  - Hemolyzed specimens with up to 500 mg/dL of hemoglobin in plasma
  - Bilirubin concentrations up to 20 mg/dL
  - Triglyceride concentrations up to 3000 mg/dL
  - Heparin and Low Molecular Weight Heparin up to 2 U/mL
- Fondaparinux at the concentration ⩾ 0.1 mg/dL or therapeutic level could falsely increase the INR level compared with laboratory reference methods.
- The *Mission*® PT/INR Monitoring System was designed to provide a quantitative measurement of Prothrombin Time for patients on warfarin therapy. Self-testing patients should be stabilized on warfarin therapy for at least 6 weeks.
- The *Mission*® PT/INR Monitoring System should not be used on individuals with severe coagulopathies such as disseminated intravascular coagulation (DIC) and other conditions with rapid changes in coagulation status (e.g. severe sepsis, septic shock, and hypotensive shock).
- A full hanging drop of blood should always be applied onto a test strip. Never apply a second drop of blood onto the same test strip. Always use a new test strip when performing a new test.
- Low specimen volume (typically under 10μL) will cause a specific error message.

BIBLIOGRAPHY

1. *Coumadin*® is a registered trademark of the Bristol-Myers Squibb Pharma Company.
2. *Coumadin*® Official Package Insert. Rev. October 2011.
3. Cunningham, Mark et. al. "The Reliability of Manufacturer-determined Instrument-specific International Sensitivity Index Value for Calculating the International Normalized Ratio." Am. Jrnl. Clin. Pathol. July 1994. Volume 102, Number 1:128-133.
4. Sanfelippo, MJ et. al. "Falsely elevated INRs in warfarin-treated patients with the lupus anticoagulant." WMJ. 2000 Jun; 99(3):62-4, 43.

Index of Symbols

	Consult instructions for use		Use by
IVD	*In vitro* diagnostic medical device	LOT	Lot Number
REF	Catalogue number	MODEL	Model number
2°C 30°C	Temperature limit		Manufacturer
Σ	Contains sufficient for <n> tests		Do not reuse
CODE	Code Number	CTRL	Control Range
EC REP	Authorized representative in the European Community		

ACON Laboratories, Inc.
5850 Oberlin Drive, #340
San Diego, CA 92121, USA

CE 0123

EC REP
MDSS GmbH
Schiffgraben 41
30175 Hannover, Germany

Number: 1151121003
Effective date: 2021-05-27