

JUL 26 1999

IV. 510(K) SUMMARY: CARESIDE™ PROTHROMBIN TIME SAFETY AND EFFECTIVENESS

I. Applicant Information

A. Applicant Name	CARESIDE, Inc.
B. Applicant/Manufacturer Address	6100 Bristol Parkway Culver City, CA 90230
C. Telephone Number	310-338-6767
D. Contact Person	Kenneth B. Asarch, Pharm.D., Ph.D.
E. FAX Number	310-338-6789
F. e-Mail Address	AsarchK@CARESIDE.com
G. Date 510(k) Summary prepared	March 30, 1999

II. Device Information

A. Device Name (Trade)	CARESIDE™ PT
B. Device Name (Classification)	Prothrombin Time test system
C. Device Classification	Hematology panel Prothrombin Time test system Regulation Number: 21 CFR 864.7750 Regulatory Class 2 Classification Number: 81GJS
D. Special controls and performance standards	Performance Standards

III. Substantial Equivalence Claim

A. General equivalency claim

The ability to monitor coagulation events optically is widely recognized and accepted for use in coagulation tests.

Prothrombin time *in vitro* diagnostic products using optical and other detection technologies are already on the U.S. market.

B. Specific equivalency claim

This CARESIDE™ PT test is substantially equivalent in principle, intended use, and clinical performance to the currently marketed Innovin reagent for the quantitative measurement of prothrombin time on the MLA Electra 900C.

Name of Predicate Device:	Dade Innovin on the MLA Electra 900C.
Predicate Device 510K number:	K974343 (Innovin)/K884863-(Electra 900C)
Product Code:	81GJS (Innovin)/81GKP (Electra 900C)

IV. Device Description

CARESIDE™ PT cartridges are used with the CARESIDE Analyzer™ to measure prothrombin time in citrated plasma with the sample applied either as citrated whole blood or citrated plasma. The CARESIDE™ PT cartridge, a single use disposable *in vitro* diagnostic test cartridge, aids in specimen separation and delivers a measured volume of plasma to a cartridge cuvette to initiate the measurement of prothrombin time. The cartridge (patent pending) contains all reagents necessary to measure prothrombin time.

A. Explanation of Device Function

Each CARESIDE™ PT cartridge consists of a cuvette with dried recombinant rabbit tissue factor with calcium ions mounted in a plastic cartridge with a hinged lid. The user opens the pouch, introduces the citrated whole blood or citrated plasma specimen into the cartridge Sample Well, closes the lid and inserts the cartridge into the CARESIDE Analyzer™.

Once loaded, the CARESIDE Analyzer™ scans the cartridge barcode, brings the cartridge and the contained specimen to 37°C, and spins the cartridge to move the sample from the Sample Well into the cartridge channels and chambers. As the cartridge continues to spin, the blood cells are separated from the plasma and the cells accumulate in the separation well. Forty microliters of citrated plasma remain in the metering passage. Any excess sample flows into an overflow well. Once the analyzer completes any other tests, the sample is added to begin the coagulation test. The metered volume of sample is dispensed into the cuvette by a plunger that displaces a flexible seal that covers the Sample Well while a second plunger seals the cartridge vent. As the flexible seal is displaced, air is forced through the metering passage, forcing the sample out and into the cuvette to mix with the reagent. The cuvette is then positioned over an LED and the coagulation event is optically monitored. An onboard timer measures the coagulation time.

Test Cartridge Architecture:

Dried PT Reagent $\xrightarrow{\text{Diluent}}$ Reconstituted PT Reagent
PT Reagent + Plasma \longrightarrow Stable Clot

Photodiodes monitor the amount of scattered light transmitted by a 570 nanometer light emitting diode to optically monitor the progress of the clot formation. The time at which a clot is detected is reported as the prothrombin time. The results are also reported as the prothrombin ratio (% PT/mean normal PT reference interval) or as the INR (International Normalized Ratio).

B. Test Summary

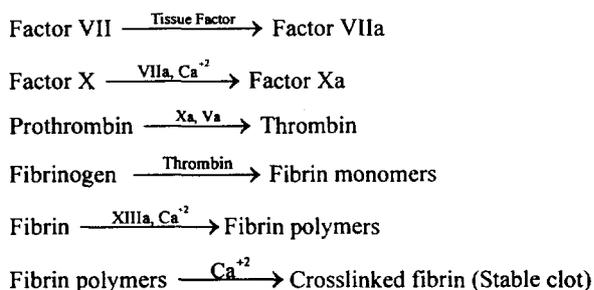
The prothrombin time is a screening test for the extrinsic and common coagulation pathway that was originally described by Quick in 1935. The prothrombin time test is sensitive to the coagulation factor abnormalities and to factor inhibitors affecting coagulation II, V, VII, and X, plus proteins C and S. Each component of the prothrombin reagents (calcium ions, tissue factor, and phospholipids) is required to initiate clotting. Differences among PT reagent preparations affect their sensitivity to reductions in coagulation factors. Accordingly, PT reagents are characterized by an international sensitivity index (ISI).

Various methods have been used historically to report and interpret prothrombin time results in order to account for differences in thromboplastin sensitivity. For example, prothrombin time results have been expressed as the ratio between a patient's prothrombin time and the mean normal prothrombin time reference interval.

Prothrombin time results are also reported as the International Normalized Ratio as recommended by the International Committee on Thrombosis and Hemostasis and the International Council for Standardization in Hematology. The INR is the equivalent PT ratio that would be obtained if the appropriate International Reference Preparation (ISI = 1.0, World Health Organization) were used as the source of thromboplastin in the performance of the prothrombin time.

The time required for the formation of a fibrin clot provides information regarding the presence and activity of coagulation factors I (fibrinogen), II, V, VII, and X. The factors II, VII, and X are dependent upon the co-factor vitamin K for activation by post-translational carboxylation. The prothrombin time may be increased in patients with hepatic disease, vitamin K deficiency or in patients on vitamin K antagonist anticoagulant therapy such as warfarin. Likewise, significant alterations in the intake of vitamin K will affect the prothrombin time.

EXTRINSIC COAGULATION PATHWAY



V. Intended Use

A. Intended Use

The CARESIDE™ PT cartridge is intended for *in vitro* diagnostic use in conjunction with CARESIDE Analyzer™ to quantitatively measure prothrombin time in applied citrated whole blood or citrated plasma.

B. Indications for Use

To be used with the CARESIDE Analyzer™ to measure PT from applied citrated whole blood or citrated plasma specimens as a general screening procedure for the detection of possible clotting deficiencies in the extrinsic pathway or to monitor patients receiving anticoagulant therapy.

VI. Technological Characteristics

A. Similarities

	CARESIDE™ PT	Innovin on Electra 900C
Intended Use	A general screen for the detection of clotting deficiencies in the extrinsic pathway or to monitor patients receiving anticoagulant therapy.	For use in prothrombin time determinations and prothrombin time-based assays.
Indications	For <i>in vitro</i> diagnostic use. For professional laboratory use.	Same
Measurement	Quantitative	Same
Method Principle	Classical one-stage prothrombin time (optical clot detection in the presence of recombinant rabbit tissue factor and synthetic phospholipids.)	Same, except type recombinant tissue factor is human in lieu of rabbit
Clot Detection Algorithm	Peak of second derivative of optical time course	Peak of second derivative of optical time course
Specimen dilution	Not required	Same
Materials	Dried recombinant rabbit brain tissue factor, synthetic phospholipids, and calcium.	Dried recombinant human tissue factor and phospholipids (thromboplastin) with calcium
Detection principle	Photometric	Same
Test time	Approx. 4 minute warm-up (on-board) plus clot time.	Approx. 1 minute warm-up (on-board) plus clot time
Sample Type	Applied citrated whole blood or citrated plasma	Citrated plasma
Specimen volume	40 µl test volume (300 ± 50 µl applied volume whole blood or plasma)	100 µl (plasma)
Quality Control	2 levels	Same
Reporting Units	Sec, PT Ratio, INR	Sec and (PT Ratio or INR)
Reaction Temp.	37 °C	37.6 °C

B. Differences

	CARESIDE™ PT	Innovin on Electra 900C
Direct blood specimen	Yes, whole blood	No, requires separation of whole blood prior to sample application
Accurate pipetting	Not required	Required
Reagent pre-warming	On-board	On-board

C. Comparative Performance Characteristics

	CARESIDE™ PT	Innovin on Electra 900C
Detection limit	9 sec	7 sec
Reportable range	9 to 75 sec	7 to 106 sec
Precision	Total CV, 10.2 sec, 4.1%	Not available
Accuracy via Method comparison	CARESIDE™ = 0.98 (Innovin on Electra 900C) + 0.60 sec, r = 0.98	
Interference	No significant interference observed at tested concentration of interferent: Bilirubin 20 mg/dL Hemoglobin 500 mg/dL Triglyceride 300 mg/dL	No data provided.

D. Conclusion

The nonclinical and clinical data provided demonstrate that the CARESIDE™ PT product is as safe, effective, and performs as well as or better than the legally marketed predicate device.



DEPARTMENT OF HEALTH & HUMAN SERVICES

JUL 26 1999

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

Kenneth B. Asarch, Pharm. D., Ph.D.
Vice President, Quality Systems and
Regulatory Affairs
Careside Inc.
6100 Bristol Parkway
Culver City, California 90230

Re: K991065
Trade Name: CARESIDE™ PT
Regulatory Class: II
Product Code: GJS
Dated: June 17, 1999
Received: June 21, 1999

Dear Dr. Asarch:

We have reviewed your Section 510(k) notification of intent to market the device referenced above and we have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into either class II (Special Controls) or class III (Premarket Approval), it may be subject to such additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 895. A substantially equivalent determination assumes compliance with the Current Good Manufacturing Practice requirements, as set forth in the Quality System Regulation (QS) for Medical Devices: General regulation (21 CFR Part 820) and that, through periodic QS inspections, the Food and Drug Administration (FDA) will verify such assumptions. Failure to comply with the GMP regulation may result in regulatory action. In addition, FDA may publish further announcements concerning your device in the Federal Register. Please note: this response to your premarket notification submission does not affect any obligation you might have under sections 531 through 542 of the Act for devices under the Electronic Product Radiation Control provisions, or other Federal laws or regulations.

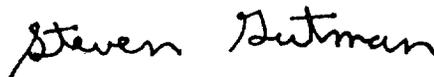
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Under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88), this device may require a CLIA complexity categorization. To determine if it does, you should contact the Centers for Disease Control and Prevention (CDC) at (770) 488-7655.

This letter will allow you to begin marketing your device as described in your 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801 and additionally 809.10 for in vitro diagnostic devices), please contact the Office of Compliance at (301) 594-4588. Additionally, for questions on the promotion and advertising of your device, please contact the Office of Compliance at (301) 594-4639. Also, please note the regulation entitled, "Misbranding by reference to premarket notification"(21 CFR 807.97). Other general information on your responsibilities under the Act may be obtained from the Division of Small Manufacturers Assistance at its toll-free number (800) 638-2041 or (301) 443-6597, or at its internet address "<http://www.fda.gov/cdrh/dsma/dsmamain.html>".

Sincerely yours,



Steven I. Gutman, M.D, M.B.A.
Director
Division of Clinical
Laboratory Devices
Office of Device Evaluation
Center for Devices and
Radiological Health

Enclosure

VI. INDICATIONS FOR USE

510(k) Number:

K991065

Device Name:

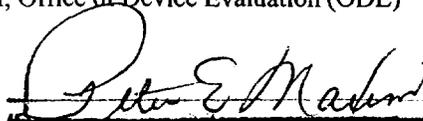
CARESIDE™ PT

Indications for use:

For *in vitro* diagnostic use with the CARESIDE Analyzer™ to measure prothrombin time from applied citrated whole blood or citrated plasma as a general screening procedure for the detection of possible clotting deficiencies in the extrinsic pathway or to monitor patients receiving anticoagulant therapy.

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)



Division Sign-Off

Division of Clinical Laboratory Devices

510(k) Number

K991065

Prescription Use
(Per 21 CFR 801.109)

OR

Over-The-Counter Use
(Optional Format 1-2-96)