LIMING BIO

diagnostics are ASSURED

StrongStep®

Neisseria gonorrhoeae and Chlamydia trachomatis antigen combo rapid test

(Dyed latex immunochromatography)

REF : 500050 **Specimen:** Swab

Language: English **Version:** 02

Effective Date: 2011-12

For professional in vitro diagnostic use only.

INTENDED USE

The *StrongStep*® Neisseria gonorrhoeae and Chlamydia trachomatis antigen combo rapid test is an immunochromatographic assay for the qualitative presumptive detection of Neisseria gonorrhoeae and/or Chlamydia trachomatis in female endocervical swab and male urethral swab specimens. This kit is intended for use as an aid in the diagnosis of Neisseria gonorrhoeae and/or Chlamydia trachomatis infection.

INTRODUCTION

Gonorrhea is a sexually transmitted disease caused by the bacterium Neisseria gonorrhoeae. Gonorrhea is one of the most common infectious bacterial diseases and is most frequently transmitted during sexual intercourse, including vaginal, oral and anal sex. The causative organism can infect the throat, producing a severe sore throat. It can infect the anus and rectum, producing a condition called proctitis. With females, it can infect the vagina, causing irritation with drainage (vaginitis). Infection of the urethra may cause urethritis with burning, painful urination, and a discharge. When women have symptoms, they often note vaginal discharge, increased urinary frequency, and urinary discomfort. But there are 5%～20% of men and 60% of women patient that do not show any symptoms. Spread of the organism to the fallopian tubes and abdomen may cause severe lower-abdominal pain and fever. The average incubation for Gonorrhea is approximately 2 to 5 days following sexual contact with an infected partner. However, symptoms may appear as late as 2 weeks. A preliminary diagnosis of Gonorrhea can be made at the time of examination. In women, Gonorrhea is a common cause of pelvic inflammatory disease (PID). PID can lead to internal abscesses and long-lasting, chronic pelvic pain. PID can damage the fallopian tubes enough to cause infertility or increase the risk of ectopic pregnancy.

The genus *Chlamydia* includes three species: *Chlamydia trachomatis, Chlamydia pneumoniae*, a primarily human pathogen, and *Chlamydia psittasi*, primarily animal pathogen. *Chlamydia trachomatis* comprise 15 known serovars, is associated with trachomatis and genitourinary infection, and three serovars are associated with lymphogranuloma venereum (LGV). *Chlamydia trachomatis* infections is one of the most common sexually transmitted diseases. Approximately 4 million new cases occur each year in the United States, primarily cervicitis and nongonococcal urethritis. This organism also causes conjunctivitis, and infant pneumonia. *Chlamydia trachomatis* infection has both a high prevalence and asymtomatic carriage rate, with frequent serious complications in both women and neonates. Complications of *Chlamydia* infection in women include cervictis, urethritis, endometritis, pelvic inflammatory diseases (PID) and increased incidence of ectopic pregnancy and infertility. Vertical transmission of the disease during parturition from mother to neonate can result in inclusion conjunctivitis and pneumonia. In men at least 40% of the cases of nongonococcal urethritis are associated *with Chlamydia* infection. Approximately 70% of women with endocervical infections and up to 50% of men with urethral infections are asymptomatic.*Chlamydia psittasi* infection is associated with respiratory disease in individuals exposed to infected birds and is not transmitted from human to human. *Chlamydia pneumonia*, first isolated in 1983, is associated with respiratory infections and pneumonia. Traditionally, *Chlamydia* infection has been diagnosed by the detection of *Chlamydia* inclusions in tissue culture cells. Culture method is the most sensitive and specific laboratory method, but it is labor intensive, expensive, long time (2-3 days) and not routinely available in most institutions. Direct tests such as immunofluorescence assay (IFA) require specialized equipment and a skilled operator to read the result.

PRINCIPLE

StrongStep® Neisseria gonorrhoeae and Chlamydia trachomatis antigen combo rapid test detects *Neisseria gonorrhoeae and/or Chlamydia trachomatis* through visual interpretation of color development on the internal strip. Two strips are contained in each device, one for Gonorrhoeae detection while the other one for Chlamydia detection.

Gonococcal or Chlamydia Antigen-specific antibodies is immobilized on the test region of the membrane. During testing, the specimen reacts with anti-Gonorrhoeae and/or Chlamydia antibodies which conjugated to colored particles and precoated onto the conjugate pad of the test. The mixture then migrates through the membrane by capillary action and interacts with reagents on the membrane. If there is sufficient Gonorrhoeae and/or Chlamydia antigen in the specimen, a colored band will form at the test region of the membrane. The presence of this colored band indicates a positive result, while its absence indicates a negative result. The appearance of a colored band at the control region serves as a procedural control, indicating that the proper volume of specimen has been added and membrane wicking has occurred.

KIT COMPONENTS

20 Individually packed test devices	Two test strips are contained in each device. Each strip contains colored conjugates and reactive reagents precoated at the corresponding regions.
1 bottle of Extraction Buffer A - 10ml	Buffer solution containing 0.2 M sodium hydroxide with yellow cap.
1 bottle of Extraction Buffer B - 10ml	Buffer solution containing 0.2 M hydrochloric acid with white cap.
1 Positive control swab (on request only)	Contain inactived Gonococci and Chlamydia as well as sodium azide. For external control.
1 Negative control swab (on request only)	Do not contain Gonococci or Chlamydia. For external control.
20 Extraction tubes	For specimen preparation
1 Workstation	For holding buffer vials and tubes
1 Package insert	For operation instructions

MATERIALS REQUIRED BUT NOT PROVIDED

Timer	For timing use.

PRECAUTIONS

- For professional *in vitro* diagnostic use only.
- Do not use after the expiration date indicated on the package. Do not use the test if the foil pouch is damaged. Do not reuse tests.
- This kit contains products of animal origin. Certified knowledge of the origin and/or sanitary state of the animals does not completely guarantee the absence of transmissible pathogenic agents. It is therefore recommended that these products be treated as potentially infectious, and handled by observing usual safety precautions (e.g., do not ingest or inhale).
- Avoid cross-contamination of specimens by using a new extraction tube for each specimen obtained.
- Read the entire procedure carefully prior to testing.
- Do not eat, drink or smoke in any area where specimens and kits are handled. Handle all specimens as if they contain infectious agents. Observe established precautions against microbiological hazards throughout the procedure and follow standard procedures for the proper disposal of specimens. Wear protective clothing such as laboratory coats, disposable gloves and eye protection when specimens are assayed.
- Do not interchange or mix reagents from different lots. Do not mix solution bottle caps.
- Humidity and temperature can adversely affect results.
- When the assay procedure is completed, dispose the swabs carefully after autoclaving them at 121°C for at least 20 minutes. Alternatively, swabs can be treated with 0.5% sodium hypochlorite (i.e., household bleach) for one hour before disposal.
- Used testing materials should be discarded according to local regulations.
- **Do not use cytology brushes with pregnant patients.**

STORAGE AND STABILITY

- The kit should be stored at 2-30°C until the expiry date printed on the sealed pouch.
- The test must remain in the sealed pouch until use.
- **Do not freeze.**
- Care should be taken to protect the components of this kit from contamination. Do not use if there is evidence of microbial contamination or precipitation. Biological contamination of dispensing equipments, containers or reagents can lead to false results.

SPECIMEN COLLECTION AND STORAGE

- The quality of specimen obtained is of extreme importance. Detection of gonorrhoeae and/or chlamydia requires a rigorous and thorough collection technique which provides cellular material rather than just body fluids. **Do not use 0.9% sodium chloride to treat swabs before collecting specimens.**

For female endocervical specimens:

- Use only Dacron or Rayon tipped sterile swabs with plastic shafts. It is recommend to use the swab supplied by the kits manufacturer (The swabs are not contained in this kit, for the ordering information, please contact the manufacturer or local distributor, the catalog numbers are 207000-female swab, 208000-male swab). Swabs from other suppliers have not been validated. Swabs with cotton tips or wooden shafts are not recommended.
- Before specimen collection, remove excess mucus from the endocervical area with a separate swab or cotton ball and discard. The swab should be inserted into the endocervical canal, past the squamocolumnar junction, until most of the tip is no longer visible. This will permit acquisition of columnar or cuboidal epithelial cells which are the main reservoir of chlamydia organisms. Firmly rotate the swab for 15 - 20 seconds without contamination with exocervical or vaginal cells.
- If the swab may be tested immediately, replace the swab into the extraction tube.

For male urethral specimens:

- Standard wire-shafted fiber-tipped swabs should be used for urethral specimen collection. Instruct the patients not to urinate at least two hours prior to specimen collection.
- Insert the swab 2-4 cm into the urea, rotate for 3-5 seconds and withdraw it. If the swab may be tested immediately, replace the swab into the extraction tube.
- Do not place the swab in any transport device containing medium. Transport medium interferes with the assay, and viability of organisms is not required for the assay. If immediate testing is not possible, patient samples should be placed in a dry transport tube for storage or transport. The swabs may be stored for 24 hours at room temperature (15-30°C) or 1 week at 4°C or no more than 6 month at -20°C. All specimens should be allowed to reach a room temperature of 15-30°C before testing.

PROCEDURE

Bring tests, specimens, reagents and/or controls to room temperature (15-30°C) before use.

1. Prepare endocervical or urethral swab specimens:

- Place a clean extraction tube in the workstation. Add 8 drops of extraction buffer A into the extraction tube.
- Immerse the patient swab into the extraction tube and wait 2 minutes. While waiting, use a circular motion to roll the swab against the side of the extraction tube so that the liquid is expressed from the swab and can reabsorb.
- At the end of the extraction time, add 8 drops of extraction buffer B into the tube and extract for another 1 minute in the same way. Then squeeze the swab firmly against the tube to expel as much liquid as possible from the swab. Discard the swab following guidelines for handling infectious agents.
- The extracted specimen can remain at room temperature for 60 minutes without affecting the test result.

2. Remove the test from the sealed pouch and place it on a clean, level surface. Label the device with patient or control identification. For best results, the assay should be performed within one hour.

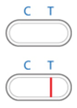
3. Add 3 drops (approximately 100 µL) of extracted specimen from the extraction tube to each one of the specimen wells (S) of the test cassette.

Avoid trapping air bubbles in the specimen well (S), and do not add any solution to the result window.

As the test begins to work, color will migrate across the membrane.

4. Wait for the colored band(s) to appear. The result should be read at 15 minutes. Do not interpret the result after 20 minutes.

INTERPRETATION OF RESULTS

POSITIVE RESULT: 	Two colored bands appear on the membrane. One band appears in the control region (C) and another band appears in the test region (T).
NEGATIVE RESULT: 	Only one colored band appears, in the control region (C). No colored band appears in the test region (T).
INVALID RESULT: 	Control band fails to appear. Results from any test which has not produced a control band in the specified read time must be discarded. Please review the procedure and repeat with a new test. If the problem persists, discontinue using the kit immediately and contact your local distributor.

NOTE:

1. The intensity of color in the test region (T) may vary depending on the concentration of analytes present in the specimen. Note that this is a qualitative test, and cannot determine the concentrations of analytes in specimens.
2. Insufficient specimen volume, incorrect operation procedure or expired tests are the most likely reasons for control band failure.

QUALITY CONTROL

- Internal procedural controls are included in the test. A colored band appearing in the control region (C) is considered as an internal positive procedural control, confirming sufficient specimen volume and correct procedural technique.
- External procedural controls may provided (on request only) in the kits to ensure that the tests are functioning properly. Also, the Controls may be used to demonstrate proper performance by the test operator. To perform a positive or negative control test, complete the steps in the Test Procedure section treating the control swab in the same manner as a specimen swab.

LIMITATIONS OF THE TEST

1. *StrongStep®* Neisseria gonorrhoeae and Chlamydia trachomatis antigen combo rapid test is for professional in vitro diagnostic use, and should only be used for the qualitative detection of *Neisseria gonorrhoeae and/or Chlamydia trachomatis*. No meaning should be inferred from the color intensity or width of any apparent bands.
2. This test will only indicate the presence of Gonococcal and/or Chlamydia antigen in specimens from both viable and non-viable *Neisseria gonorrhoeae/Chlamydia trachomatis*.
3. Detection of Gonorrhoeae and/or Chlamydia is dependent on the number of organisms present in the specimen. This may be affected by specimen collection methods and patient factors such as age, history of STD, presence of symptoms, etc. The minimum detection level of this test may vary according to serovar.
4. Women with vaginal discharge should be evaluated for risk factors of cervicitis and pelvic inflammatory disease caused by other organisms including Candida albicans, Trichomonas vaginalis or Bacterial vaginosis (These can also be diagnosed by LimingBio's other products: 500030 Candida albicans antigen rapid test; 500040 Trichomonas vaginalis Antigen Rapid test; 500060 Candida albicans/Trichomonas vaginalis antigen combo rapid test; 500080 Bacterial vaginosis rapid test).
5. As with all diagnostic tests, a definitive clinical diagnosis should not be based on the results of a single test, but should only be made by the physician after all clinical and laboratory findings have been evaluated.
6. Therapeutic failure or success cannot be determined as antigen may persist following appropriate antimicrobial therapy.
7. Excessive blood (>50 µL in case of female swabs and >20 µL in case of male swabs) may cause false positive results. Endocervical samples from female patients should not be collected during menstrual period.

PERFORMANCE CHARACTERISTICS

Table 1: *StrongStep®* Neisseria gonorrhoeae Antigen Rapid Test vs. Culture
Female Endocervical Specimens

Relative Sensitivity: 96.9% (89.2%-99.6%)* **Relative Specificity:** 95.8% (93.6%-97.4%)* **Overall Agreement:** 95.9% (93.9%-97.4%)* ***95% Confidence Interval**			Culture		
			+	-	**Total**
	StrongStep® **Gonorrhoeae Test**	+	62	21	83
		-	2	473	475
			64	494	558

Male Urethral Specimens

Relative Sensitivity: 97.8% (93.7%-99.6%)* **Relative Specificity:** 99.5% (98.2%-99.9%)* **Overall Agreement:** 99.1% (97.8%-99.7%)* ***95% Confidence Interval**			Culture		
			+	-	**Total**
	StrongStep® **Gonorrhoeae Test**	+	134	2	136
		-	3	389	392
			137	391	528

Table 2: *StrongStep®* Chlamydia trachomatis Antigen Rapid Test vs. Another Branded Chlamydia Test Plus PCR*
Female Endocervical Specimens

Relative Sensitivity: 94.12% (86.80%-98.06%)* **Relative Specificity:** 99.15% (97.85%-99.77%)* **Overall Agreement:** 98.39% (96.96%-99.26%)* ***95% Confidence Interval**			**Another Branded Chlamydia Test Plus PCR** *(Expanded gold standard)*		
			+	-	**Total**
	StrongStep® **Chlamydia Test**	+	80	4	84
		-	5	469	474
			85	473	558

Male Urethral Specimens

Relative Sensitivity: 94.59% (88.62%-97.99%)* **Relative Specificity:** 99.9% (99.12%-99.99%)* **Overall Agreement:** 98.86% (97.54%-99.58%)* ***95% Confidence Interval**			**Another Branded Chlamydia Test Plus PCR** *(Expanded gold standard)*		
			+	-	**Total**
	StrongStep® **Chlamydia Test**	+	105	0	105
		-	6	417	423
			111	417	528

*: This clinical study is performed use a famous brand Chlamydia Rapid Test as the comparison test, of which the discrepant results was confirmed by Real-time PCR.

Specificity: Cross-reactivity with organisms has been studied using suspensions of 10^7 CFU/ml. The following organisms produced negative results with the test:

Acinetobacter calcoaceticus	*Pseudomona aeruginosa*
Acinetobacter spp	*Gardnerella vaginalis*
Enterococcus faecalis	*Salmonella choleraesius*
Enterococcus faecium	*Candida albicans*
Staphylococcus aureus	*Proteus vulgaris*
Proteus mirabilis	*Hemophilus influenzae*
Group B/C Streptococcus	*Klebsiella pneumoniae*
Ureaplasma Urealyticum	*Mycoplasma hominis*
Trichomonas vaginalis	

LITERATURE REFERENCES

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GLOSSARY OF SYMBOLS

REF	Catalog number
	Temperature limitation
	Consult instructions for use
LOT	Batch code
IVD	In vitro diagnostic medical device
	Use by
	Manufacturer
Σ n	Contains sufficient for <n> tests
	Do not reuse
EC REP	Authorized representative in the European Community
CE	CE marked according to IVD Medical Devices Directive 98/79/EC

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