Read this Instructions for Use carefully before testing.

For in vitro diagnostic use only

MIZUHO MEDY Co., Ltd.

Streptococcus pneumoniae antigen kit

Quick Chaser Streptococcus pneumoniae II

[Package]

70050: Quick Chaser Streptococcus pneumoniae II - 10 tests/kit

[Contents]

1) Test plate - 10 tests
   - Rabbit polyclonal anti-*Streptococcus pneumoniae* antibodies
   - Rabbit monoclonal anti-*Streptococcus pneumoniae* antibodies
   - Colloidal gold conjugated to rabbit polyclonal anti-*Streptococcus pneumoniae* antibodies
2) Dropper - 10 pieces

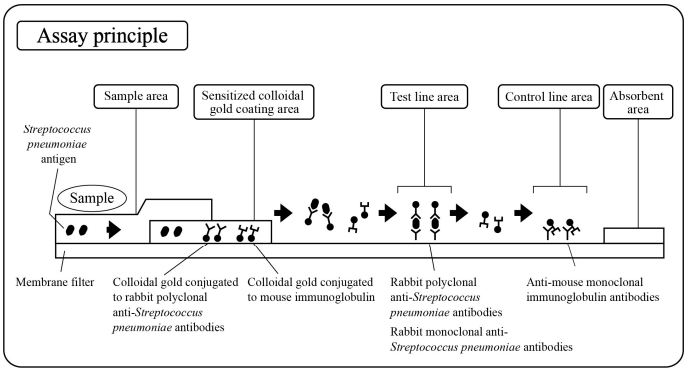
[Intended use]

For qualitative detection of *Streptococcus pneumoniae* antigen in urine or cerebrospinal fluid (CSF)
(An aid in the diagnosis of *streptococcus pneumoniae* infection)

[Principle of the test]

"Quick Chaser Streptococcus Pneumoniae II" is the in vitro diagnostic reagent for qualitative detection of *Streptococcus pneumoniae* antigen based on the immunochromatographic assay. Colloidal gold conjugated to rabbit polyclonal anti-*Streptococcus pneumoniae* antibodies and colloidal gold conjugated to mouse immunoglobulins for control line are coated in sensitized colloidal gold coating area on a membrane filter which is set in test plate. Also, rabbit polyclonal anti-*Streptococcus pneumoniae* antibodies and rabbit monoclonal anti-*Streptococcus pneumoniae* antibodies are immobilized in the test line area. Anti-mouse immunoglobulin antibodies for control line are immobilized in the control line area.

If *Streptococcus pneumoniae* antigens are present in the sample, according to the principle of immunochromatography, they react with colloidal gold conjugated to rabbit polyclonal anti-*Streptococcus pneumoniae* as they migrate from the sample area. Moreover, they are captured in the test line area by reacting with rabbit polyclonal anti-*Streptococcus pneumoniae* antibodies and rabbit monoclonal anti-*Streptococcus pneumoniae* antibodies. As a result, a purple-red line with the colloidal gold appears in the test line area.
At the same time, the colloidal gold conjugated to mouse immunoglobulin also migrate and are captured by the anti-mouse monoclonal immunoglobulin antibodies on the control line area, resulting in the appearance of a purple-red line in the control line area regardless of the presence or absence of *Streptococcus pneumoniae* antigens.



[Warnings and Precautions]

1) For in vitro diagnostic use only.
2) Procedures not described in the Instructions for Use are not guaranteed.
3) This product can be interpreted both visually and with the dedicated device "Smart QC Reader". When interpreting with the dedicated device, use it according to the Instruction for Use and User Manual of the dedicated device.
4) Dropper included in this kit is not sterilized. When performing the culture test, please separate specimens in advance to avoid the contamination of specimens.
5) Add the specified volume (about 130 µl) of specimen to the center of the sample area. If the sample volume is not as specified, the reaction may not be accurate.
6) Bring test plate to 15 to 30℃ prior to testing.
7) Strictly follow the interpretation time to avoid false-negative and false-positive.
8) Specimen may contain not only *Streptococcus pneumoniae* but also other infectious materials. Handle specimen with great care as there is a risk of infection during the test.
9) When using, wear protective equipment (glasses, disposable gloves, mask, etc.) and be careful not to let the sample (specimen) directly adhere to the skin or get into your eyes.
10) If a specimen accidentally gets into your eyes or mouth, take first-aid measures such as rinsing it thoroughly with water, and seek medical attention if necessary.
11) The material of the membrane used for the test plate is nitrocellulose. Do not perform tests near a fire as nitrocellulose is extremely flammable.
12) If the sample (specimen) spatters, wipe it off with alcohol for disinfection, etc.
13) Do not freeze this product. Store it in accordance with the description of storage. Do not use frozen reagents as they may change the quality and may not give correct results.
14) Do not use this product beyond the expiration date.
15) Use the test plate immediately after opening the aluminum foil pouch. If the test plate is left in a room for a long period of time, it could not react by exposure to moisture.
16) Do not touch sample area, test line area, and control line area by hand directly.
17) Do not perform the test in a place such as under an air conditioner where the dry wind directly blows the surface of the test plate to prevent uneven migration.
18) Do not use the reagents, accessories, etc. of this product for any purpose other than this test.
19) Test plates and droppers are intended for single use only.
20) Handle liquid waste and used utensils by any of the following disinfection and sterilization methods as sample (specimen) may contain infectious material such as HIV, HBV, and HCV, etc.
    a) Immerse in sodium hypochlorite solution (effective chlorine concentration of 1,000 ppm) for 1 hour or longer
    b) Immerse in 2% glutaraldehyde solution for 1 hour or longer
    c) Autoclave at 121℃ for 20 minutes or longer
21) Regarding disposal of used reagents and utensils, dispose of them in accordance with the Local Regulation and Law of waste disposal.

[Storage and stability of the device]

Store kit at 1 to 30°C, out of direct sunlight or high humidity. Kit contents are stable until the expiration dates printed on the product box and packaging. Do not freeze.

[Specimen collection and handling]

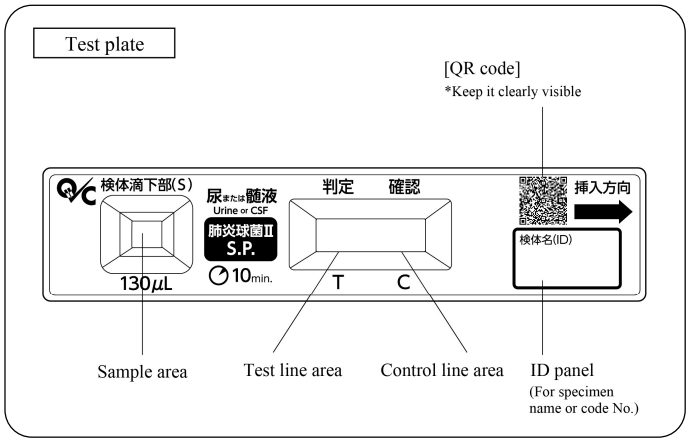
1. Urine
   Collect urine specimen in an aseptic container.
2. CSF
   Collect CSF specimen in an aseptic container according to standard procedures.

Collected urine specimen and CSF specimen should be tested as soon as possible. If the specimen cannot be tested immediately or needs to be stored for a long period of time, a test should be performed within 3 days if stored at 5 to 30℃ or within 14 days if stored at -80 to 4℃. Do not repeat freezing and thawing of the specimen three times or more. Specimen should be brought to 15 to 30℃ prior to use.

[Test procedure]

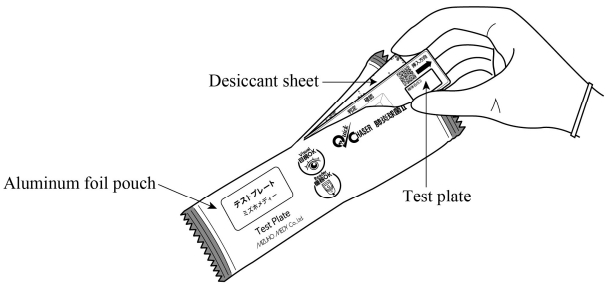
This product can be interpreted both visually and with a dedicated device.

· Details of test plate

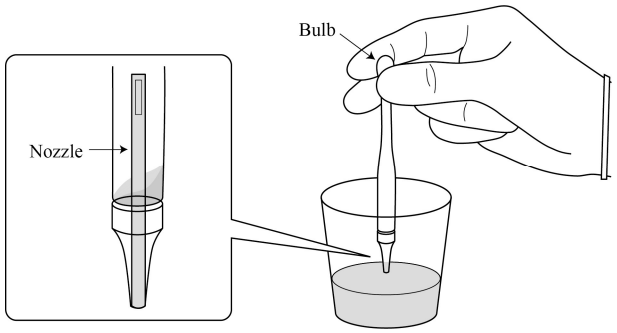


· Test procedure

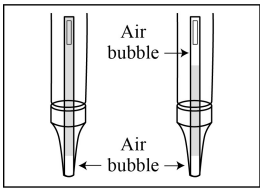
1) Preparation of reagent
   Test plate: No prior preparation required.
2) Test procedure
   1.Remove the test plate from the aluminum foil pouch. Discard the desiccant sheet included in the aluminum foil pouch.
   (Note) Please be careful not to stain the QR code when writing the sample name in the ID panel.



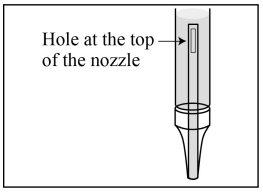
2. Squeeze the bulb of the dropper included in the kit and draw up a sufficient amount of specimen to fill the nozzle in one suction with the tip of the dropper completely immersed in the specimen. The excess specimen drawn up would overflow inside the dropper from the nozzle part and remains in the dropper.



Note) In the cases as shown below, the correct amount of the specimen cannot be dropped.

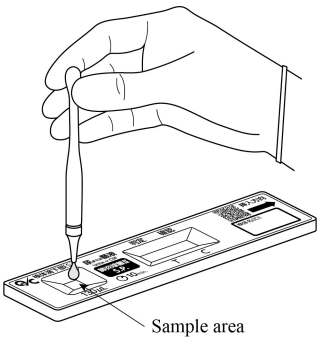


If air bubbles enter into the nozzle, discharge the specimen and fill the nozzle again.



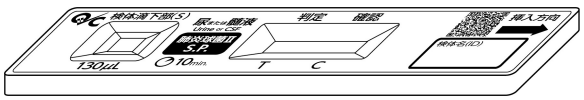
Do not draw up the specimen repeatedly until the specimen overflowing from the nozzle exceeds the hole at the top of the nozzle. If the specimen exceeds the hole at the top of the nozzle, collect the specimen with a new dropper.

3. Drop the specimen on the sample area of the test plate by squeezing the bulb of the dropper. The required amount (about 130 μL) of the specimen is discharged.



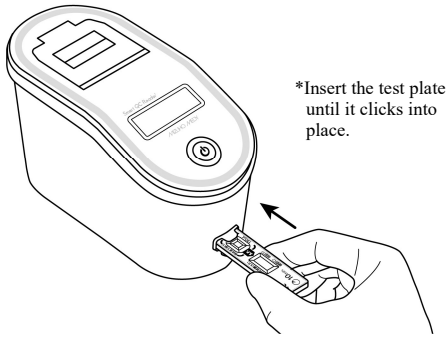
<When interpreting visually>

4.-1 Leave to react at 15 to 30°C.
   Interpret test results visually by reading lines in the test line area and control line area after 5 to 10 minutes.



<When interpreting with the dedicated device>

4.-2 A method of reading and interpreting the lines that appear in the test line area and control line area with the dedicated device.
   After checking the insertion direction of the test plate, measure according to the operation method of "Mode 1" or "Mode 2".
   Note) • Do not attach labels etc. on the test plate.
   • Be careful not to touch the sample area when inserting the test plate.
   • Insert the test plate by keeping it horizontal to prevent the sample from spilling or splashing into the instrument.
   • Insert the test plate all the way.



1) Mode 1 [Read Now]
This mode interprets the test plate after the reaction time has elapsed.
1. Leave to react at 15 to 30°C.
2. After 10 minutes, insert the test plate into the test plate insertion slot of the dedicated device.
3. The lines appearing in the test line area and control line area are read inside the dedicated device.

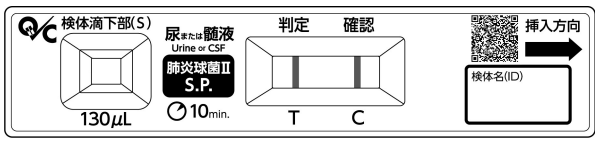
2) Mode 2 [Walk Away]
This mode automatically interprets the test plate after dropping the sample inside the dedicated device.
1. Immediately after dropping the sample, insert the test plate into the test plate insertion slot of the dedicated device.
2. The measurement starts automatically, and the lines appearing in the test line area and control line area are read every minute after 5 minutes inside the dedicated device.

[Interpretation]

<When interpreting visually>
Interpretation by the existence of red-purple lines in the test line area and control line area.

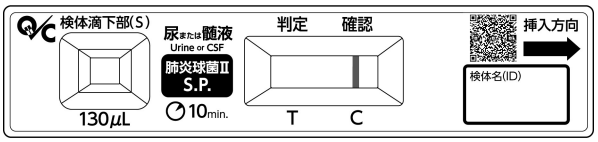
<Positive>
Both test line and control line appear.

Positive



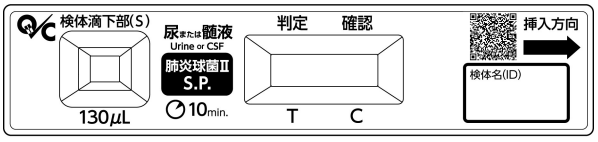
<Negative>
Only a control line appears.

Negative

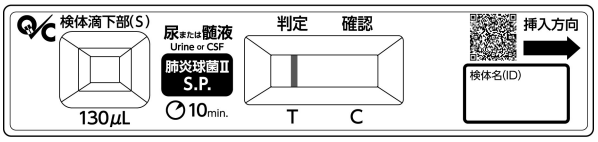


<Retest>
If both test line and control line do not appear or no control line appears, an operational error such as insufficient sample volume may be considered. Recheck test procedure and retest with the new test plate. If the same result comes out in the retest again, confirm it with other methods.

Retest



Retest



<When interpreting with the dedicated device>
Both Mode 1 [Read Now] and Mode 2 [Walk Away] are automatically interpreted according to the interpretation method of < When interpreting visually> based on the result of reading the lines with the dedicated device. Interpretation and display on the device screen are the same in Mode 1 [Read Now] and Mode 2 [Walk Away].

Interpretation	Display on the device screen
Positive	S.P : ＋
Negative	S.P : －
Retest	S.P : ＊　#03

*Error code #03: Error when the control line is not detected.
*For error codes other than error code #03, refer to the User Manual of the dedicated device.

[Limitations]

1) Diagnosis of *Streptococcus pneumoniae* infection should not be based solely on the test results of this product but should be comprehensively made in consideration of other test results and clinical symptoms.
2) Use urine or CSF as a specimen. Do not use serum, sputum, or oropharyngeal swab, etc.
3) Do not use the turbid specimen containing pus or blood, etc.
4) When *Streptococcus pneumoniae* vaccine is inoculated, vaccine-derived antigens excrete in urine for a few days, possibly resulting in positive result.
5) In the case both test line and control line appear at 5 to 10 minutes after dropping the sample, it can be interpreted as positive. Negative should be interpreted at 10 minutes after dropping the sample. The streak line might appear before 10 minutes temporarily. Do not interpret the temporal streak line as the appearance of the test line. After 10 minutes, colloidal gold can appear like a line due to the drying of the test plate with time. Therefore, please interpret test results at 10 minutes.
6) This product is used as an aid in the diagnosis for *Streptococcus pneumoniae* infection. In case *Streptococcus pneumoniae* antigen amount in the specimen are below the detection limit of the test, test result could be interpreted as negative, even though the patient is infected by *Streptococcus pneumoniae*. In addition, a non-specific reaction may occur depending on the factors in the sample, and a negative specimen may be interpreted as positive. The final definitive diagnosis should be made comprehensively from clinical symptoms and other test results.
7) *Streptococcus mitis* and *Streptococcus pseudopneumoniae* have a common antigen with *Streptococcus pneumoniae*, hence false positive result may be obtained.
8) Regarding infants and toddlers, if *Streptococcus pneumoniae* habitually resides in the nasopharynx, *Streptococcus pneumoniae* antigens excrete in urine and possibly resulting in positive result.
9) It is said that the quantity of the urinary *Streptococcus pneumoniae* antigen reaches and exceeds the detectable amount after 3 days from an appearance of a pneumonia symptom, but it varies from case to case. In addition, the antigen may be excreted in urine from a few days to several weeks after the infection. When interpreting the results, consider the past medical history and clinical symptoms carefully and do not use it to determine the treatment effect.
10) This product uses rabbit antibody as a raw material. Please note that patients receiving treatment with rabbit antiserum may cause false positives.
11) The results of the visual interpretation and the interpretation with the dedicated device may not match. In such a case, make a comprehensive judgement based on both results, clinical symptoms, and other test results.
12) When interpreting with the dedicated device, if the control line area or test line area of the test plate is scratched or foreign matter (dust) is attached, it may be mistakenly detected as a line.
13) When using Mode 1 [Read Now] in the interpretation with the dedicated device, be sure to perform the measurement 10 minutes after the sample is dropped. If measured within 10 minutes, correct results may not be obtained.

[Performance characteristics]

1) Performance
1. Sensitivity
When in-house positive control [Note 1)] was tested, a positive result was obtained.
2. Accuracy
• When in-house positive control was tested, a positive result was obtained.
• When in-house negative control [Note 2)] was tested, negative result was obtained.
3. Reproducibility
• When in-house positive control was tested three times simultaneously, positive result was shown in all cases.
• When in-house negative control was tested three times simultaneously, negative result was shown in all cases.
Note 1) *Streptococcus pneumoniae* antigen control solution (ATCC49619) diluted with in-house negative control to be equivalent to 6.25×10^1 CFU/mL of the calibration reference standard.
Note 2) Aqueous solution containing urea and sodium chloride
4. Detection limit
1.56×10^1 CFU/mL (ATCC49619)

5. Serotype and reactivity

It is confirmed that this product reacts with *Streptococcus pneumoniae* serotypes 1, 2, 3, 4, 5, 6A, 6B, 6C, 6D, 7F, 7C, 8, 9N, 9V, 10A, 11A/E, 12F, 13, 14, 15A, 15B, 15C, 16F, 17F, 18C, 19F, 19A, 20, 22F, 23F, 23A, 24F, 24B, 28F, 29, 31, 33F, 34, 35B, 37, 38.

2) Correlations

• Urine

Comparison with existing approved products
(immunochromatographic assay)

Quick Chaser Streptococcus pneumoniae II

Other product (1)	Positive	Negative	Total
Positive	57	1*2	58
Negative	10*1	62	72
Total	67	63	130

Positive agreement rate : 98.3%(57/58)
Negative agreement rate : 86.1%(62/72)
Total agreement rate : 91.5%(119/130)

*1 Six out of ten discrepant cases were determined as positive by Other product (2).

*2 One discrepant case was determined as positive by Other product (2).

Quick Chaser Streptococcus pneumoniae II

Other product (2)	Positive	Negative	Total
Positive	63	2*4	65
Negative	4*3	61	65
Total	67	63	130

Positive agreement rate : 96.9%(63/65)
Negative agreement rate : 93.8%(61/65)
Total agreement rate : 95.4%(124/130)

*3 Four discrepant cases were determined as negative by Other product (1).

*4 One of two discrepant cases was also determined as negative by Other product (1).

• CSF

Comparison with existing approved product
(immunochromatographic assay)

Quick Chaser Streptococcus pneumoniae II

Other product (1)	Positive	Negative	Total
Positive	27	0	27
Negative	0	54	54
Total	27	54	81

Positive agreement rate : 100%(27/27)
Negative agreement rate : 100%(54/54)
Total agreement rate : 100%(81/81)

Comparison with existing approved product
(latex agglutination method)

Quick Chaser Streptococcus pneumoniae II

Other product (3)	Positive	Negative	Total
Positive	15	0	15
Negative	12*5	54	66
Total	27	54	81

Positive agreement rate : 100%(15/15)
Negative agreement rate : 81.8%(54/66)
Total agreement rate : 85.2%(69/81)

*5 Twelve discrepant cases were determined as positive by Other product (1).

3) Calibration reference material (Standard material)

Streptococcus pneumoniae (ATCC49619)

4) Interfering substances and medications

Following substances and blood did not interfere with the performance of this product at the concentration listed below.

- Glucose (5000 mg/dL)
- Albumin (2000 mg/dL)
- Ascorbic acid (500mg/dL)
- Acetylsalicylic acid (2000 mg/dL)
- Ibuprofen (500 mg/dL)
- Sodium chloride (2000 mg/dL)
- Calcium chloride (110 mg/dL)
- Urea (5000 mg/dL)
- Cold medicine (acetaminophen concentration) (500mg/dL)
- Blood (2%)
- Bilirubin(10mg/dL)

5) Cross reactivity

Cross reactivity was not observed with the following bacteria and viruses.

• Bacteria

Candida albicans, Chlamydophila (Chlamydia) pneumoniae, Citrobacter freundii, Enterobacter aerogenes, Enterobacter cloacae, Enterococcus faecalis, Escherichia coli, Haemophilus influenzae a*, Haemophilus influenzae* b*, Haemophilus influenzae* c*, Haemophilus influenzae* d*, Haemophilus influenzae* e*, Haemophilus influenzae* f*, Klebsiella pneumoniae, Legionella pneumophila, Listeria monocytogenes, Moraxella catarrhalis, Mycoplasma pneumoniae, Neisseria gonorrhoeae, Neisseria meningitidis* A*, Neisseria meningitidis* B*, Neisseria meningitidis* C*, Neisseria meningitidis* Y*, Neisseria meningitidis* W-135*, Proteus mirabilis, Pseudomonas aeruginosa, Serratia marcescens, Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus anginosus, Streptococcus* Group A*, Streptococcus* Group B*, Streptococcus* Group C*, Streptococcus* Group F*, Streptococcus* Group G*, Streptococcus mutans*

• Viruses

Adenovirus 3, Adenovirus 11, Adenovirus 19, Adenovirus 37, Coronavirus, Coxsackievirus A7, Coxsackievirus B3, Echovirus, Epstein-Barr virus, Herpes simplex virus 2, Influenza virus A, Influenza virus B, Measles virus, Mumps virus, Parainfluenza virus 1, Respiratory syncytial virus A, Respiratory syncytial virus B, Rhinovirus 8, Rotavirus, Rubella virus, Varicella zoster virus

In addition, cross reactions were observed with *Streptococcus mitis* at 1×10^7 CFU/mL or more and *Streptococcus pseudopneumoniae* at 1×10^4 CFU/mL or more.

[Shelf life]

24 months from the date of manufacture
(As indicated on the product box and packaging)

[Reference]

Elaine R.Keith,et al.:Jcin Microbiol, 44(3), 923-927(2006)

Technical information
Telephone **+81-942-85-3845**

Manufacturer: Mizuho Medy Co.,Ltd.
5-4 Fujinoki-machi, Tosu City, Saga, 841-0048 Japan
https://www.mizuho-m.co.jp/en