BD ProbeTec™ Neisseria gonorrhoeae (GC) Q^x Amplified DNA Assay

CE 2797 IVD R_x Only bd.com/e-labeling

8081409(12)
2022-04
English

REF 441124 REF 442842

INTENDED USE

The BD ProbeTec™ *Neisseria gonorrhoeae* Q^x Amplified DNA Assay is an automated assay, when tested with either the BD Viper™ System in Extracted Mode or the BD Viper™ LT System, uses Strand Displacement Amplification technology for the direct, qualitative detection of *Neisseria gonorrhoeae* DNA in clinician-collected female endocervical and male urethral swab specimens, patient-collected vaginal swab specimens (in a clinical setting), and male and female urine specimens (both UPT and Neat). The assay is also intended for use with gynecological specimens collected in BD SurePath™ Preservative Fluid or PreservCyt™ Solution using an aliquot that is removed prior to processing for either the BD SurePath™ or ThinPrep™ Pap test. The assay is indicated for use with asymptomatic and symptomatic individuals to aid in the diagnosis of gonococcal urogenital disease.

SUMMARY AND EXPLANATION

The World Health Organization estimates the total number of new cases of *Neisseria gonorrhoeae* in adults between the ages of 15 and 49 in was 106.1 million in 2008.[1] In the United States, gonorrhea is the second most commonly reported infectious disease. In 2012, a total of 334,826 cases of gonorrhea were reported in the United States.[2] During 2011–2012, gonorrhea rates were similar between genders with the rate among women at 108.7 and the rate among men at 105.8 cases per 100,000 population.[2] Infection of women is often asymptomatic and if left untreated can lead to pelvic inflammatory disease, infertility, ectopic pregnancy and chronic pelvic pain. In men, symptoms of acute urethritis and dysuria usually cause infected individuals to present for treatment before serious sequelae result. Transmission of *N. gonorrhoeae* occurs through sexual contact but can also take place in the birth canal leading to neonatal conjunctivitis.

Because of the high frequency of asymptomatic infections, the US Preventive Services Task Force has published recommendations for screening young, sexually active women and those who are older and considered at increased risk of infection in order to prevent complications and reduce transmission.[3] The Advisory Committee on Human Immunodeficiency Virus (HIV) and Sexually Transmitted Disease (STD) Prevention also encourages active control programs that target treatable STDs as a primary intervention in the HIV epidemic.[4] Nevertheless, quinolone-resistant *N. gonorrhoeae* strains are now widely disseminated thoughout the United States and the world. Furthermore, decreased susceptibility of *N. gonorrhoeae* to cephalosporins, the only class of antimicrobials recommended and available for treatment of gonorrhoeae in the U.S., and other antimicrobials is expected to continue to spread, thus reducing the options available to combat *N. gonorrhoeae* infection.[5]

N. gonorrhoeae are gram-negative, oxidase-positive diplococci that can be observed in Gram-stained smears of urethral discharge, usually within neutrophils. Culture of *N. gonorrhoeae* can be difficult because the organism does not survive long outside the host and is highly susceptible to adverse environmental conditions such as lack of humidity and temperature extremes. Although culture of urogenital swabs remains an important tool in the diagnosis of *N. gonorrhoeae* infection due to the continued need for monitoring of antimicrobial susceptibility, use of molecular methods that amplify and detect specific nucleic acid sequences is increasing due to their applicability to both swab specimens and more easily collected urine specimens.[5,6]

When used with the BD Viper™ System or the BD Viper™ LT System, the BD ProbeTec™ GC Q^x Amplified DNA Assay involves automated ferric oxide-based extraction of DNA from clinical specimens using BD FOX™ Extraction technology after the chemical lysis of cells, followed by binding of DNA to para-magnetic particles, washing of the bound nucleic acid and elution in an amplification-compatible buffer. When present, *N. gonorrhoeae* DNA is then detected by real-time Strand Displacement Amplification (SDA) of a specific target sequence in the presence of a fluorescently-labeled detector probe.[7,8]

BD VIPER™ SYSTEM IN EXTRACTED MODE (BD VIPER™ SYSTEM)

PRINCIPLES OF THE PROCEDURE

The BD ProbeTec™ GC Q^x Amplified DNA Assay is designed for use with the BD ProbeTec™ *Chlamydia trachomatis/Neisseria gonorrhoeae* (CT/GC) Q^x specimen collection and transport devices, applicable reagents, the BD Viper™ System and BD FOX™ Extraction. Specimens are collected and transported in their respective transport devices which preserve the integrity of the *N. gonorrhoeae* DNA over the specified ranges of temperature and time. Urine and swab specimens undergo a pre-warm step in the BD Viper™ Lysing Heater to dissolve mucus and homogenize the specimen. After cooling, the specimens are loaded onto the BD Viper™ System which then performs all the steps involved in extraction and amplification of target DNA, without further user intervention. For gynecological specimens that are collected and transported in BD SurePath™ Preservative Fluid or PreservCyt™ Solution, the pre-warm step is not necessary; i.e., an aliquot is simply transferred to a Liquid-Based Cytology Specimen (LBC) Dilution Tube for the BD ProbeTec™ Q^x Amplified DNA Assays prior to loading on the instrument. The specimen is transferred to an Extraction Tube that contains ferric oxide particles in a dissolvable film and dried Extraction Control. A high pH is used to lyse the bacterial cells and liberate their DNA into solution. Acid is then added to lower the pH and induce a positive charge on the ferric oxide, which in turn binds the negatively charged DNA. The particles and bound DNA are then pulled to the sides of the Extraction Tube by magnets and the treated specimen is aspirated to waste. The particles are washed and a high pH Elution Buffer is added to recover the purified DNA. Finally, a Neutralization Buffer is used to bring the pH of the extracted solution to the optimum for amplification of the target.

The BD ProbeTec™ GC Q^x Amplified DNA Assay is based on the simultaneous amplification and detection of target DNA using amplification primers and a fluorescently-labeled detector probe.[8,9] The reagents for SDA are dried in two separate disposable microwells: the Priming Microwell contains the amplification primers, fluorescently-labeled detector probe, nucleotides and other reagents necessary for amplification, while the Amplification Microwell contains the two enzymes (a DNA polymerase and a restriction endonuclease) that are required for SDA. The BD Viper™ System pipettes a portion of the purified DNA solution from each Extraction Tube into a Priming Microwell to rehydrate the contents. After a brief incubation, the reaction mixture is transferred to a corresponding, pre-warmed Amplification Microwell which is sealed to prevent contamination and then incubated in one of the two thermally-controlled fluorescent readers. The presence or absence of *N. gonorrhoeae* DNA is determined by calculating the peak fluorescence (Maximum Relative Fluorescent Units [MaxRFU]) over the course of the amplification process and by comparing this measurement to a predetermined threshold value.

In addition to the fluorescent probe used to detect amplified *N. gonorrhoeae* target DNA, a second fluorescently-labeled oligonucleotide is incorporated in each reaction. The Extraction Control (EC) oligonucleotide is labeled with a different dye than that used for detection of the *N. gonorrhoeae*-specific target and is used to confirm the validity of the extraction process. The EC is dried in the Extraction Tubes and is re-hydrated upon addition of the specimen and extraction reagents. At the end of the extraction process, the EC fluorescence is monitored by the BD Viper™ instrument and an automated algorithm is applied to both the EC and *N. gonorrhoeae*-specific signals to report specimen results as positive, negative, or EC failure.

MATERIALS PROVIDED

Each BD ProbeTec™ GC Q^x Reagent Pack contains

- GC Q^x Amplified DNA Assay Priming Microwells, 12 x 96: each Priming Microwell contains approximately 30 pmol oligonucleotides, 45 pmol fluorescently-labeled detector probe, 100 nmol dNTPs, with stabilizers and buffer components.
- GC Q^x Amplified DNA Assay Amplification Microwells, 12 x 96: each Amplification Microwell contains approximately 14 units DNA polymerase and 50 units restriction enzyme, with stabilizers and buffer components.

NOTE: Each microwell pouch contains one desiccant bag.

MATERIALS REQUIRED BUT NOT PROVIDED

Control Set for the BD ProbeTec™ CT/GC Q^x Amplified DNA Assays: 24 CT/GC Q^x Positive Control Tubes containing approximately 2,400 copies each of pCTB4 and pGCint3 linearized plasmids in carrier nucleic acid, and 24 CT/GC Q^x Negative Control Tubes containing carrier nucleic acid alone. The concentrations of the pCTB4 and pGCint3 plasmids are determined by UV spectrophotometry.

Q^x Swab Diluent for the BD ProbeTec™ Q^x Amplified DNA Assays: 48 tubes each containing approximately 2 mL of potassium phosphate/potassium hydroxide buffer with DMSO and preservative.

Liquid-Based Cytology Specimen (LBC) Dilution Tube for the BD ProbeTec™ Q^x Amplified DNA Assays (LBC Specimen Dilution Tube): 400 tubes each containing approximately 1.7 mL of Tris/Sodium Chloride solution and preservative.

BD FOX™ Extraction Tubes: 48 strips of 8 tubes, each containing approximately 10 mg of iron oxide in a dissolvable film and approximately 240 pmol fluorescently-labeled Extraction Control oligonucleotide.

BD Viper™ Extraction Reagent and Lysis Trough: each 4-cavity Extraction Reagent trough contains approximately 16.5 mL Binding Acid, 117 mL Wash Buffer, 35 mL Elution Buffer, and 29 mL Neutralization Buffer with preservative; each Lysis Trough contains approximately 11.5 mL Lysis Reagent.

INSTRUMENT, EQUIPMENT AND SUPPLIES REQUIRED

Materials Available from BD

BD Viper™ Instrument, BD Viper™ Instrument Plates, BD Viper™ Pipette Tips, BD Viper™ Tip Waste Boxes, BD Viper™ Amplification Plate Sealers (Black), BD Viper™ Lysing Heater, BD Viper™ Lysing Rack, BD Viper™ Neutralization Pouches, Specimen Tubes and Caps for use on the BD Viper™ System (Extracted Mode), Urine Preservative Transport for the BD ProbeTec™ Q^x Amplified DNA Assays (Q^x UPT), BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens, Male Urethral Specimen Collection Kit for the BD ProbeTec™ Q^x Amplified DNA Assays, Vaginal Specimen Transport for the BD ProbeTec™ Q^x Amplified DNA Assays, BD ProbeTec™ Accessories, Liquid-Based Cytology Specimen (LBC) Dilution Tube Caps

for the BD ProbeTec™ Q^x Amplified DNA Assays, BD Viper™ Liquid-Based Cytology Specimen Rack.

Materials Required But Not Available from BD

Nitrile gloves, 3% (w/v) hydrogen peroxide*, 1% (v/v) sodium hypochlorite**, DNA *AWAY*™, *Neisseria gonorrhoeae* ATCC® 19424 (diluted in phosphate buffered saline) or Bio-Rad AmpliTrol™ CT/GC, *Chlamydia trachomatis* ATCC VR-879 (Serovar H) or VR-902B (LGV II) (diluted in phosphate buffered saline), displacement pipettes, polypropylene aerosol-resistant pipette tips capable of delivering 0.5 ± 0.05 mL, and a vortex mixer.

*Do not use hydrogen peroxide from a bottle rubber that has remained open for longer than 8 days.

**Prepare fresh daily.

Storage and Handling Requirements

Reagents may be stored at 2–33 °C. Unopened Reagent Packs are stable until the expiration date. Once a pouch is opened, the microwells are stable for 6 weeks if properly sealed or until the expiration date, whichever comes first. Do not freeze.

Warnings and Precautions

General

1. For in vitro diagnostic use. For Use by Trained Laboratory Personnel.
2. Pathogenic microorganisms, including hepatitis viruses and Human Immunodeficiency Virus, may be present in clinical specimens. "Standard Precautions"[10-13] and institutional guidelines should be followed in handling all items contaminated with blood and other body fluids.
3. For additional specific **warning**s, cautions and notes specific to the BD Viper™ System, consult the BD Viper™ System User's Manual.

Dispose of all used reagents and any other contaminated disposable materials following procedures for infectious or potentially infectious waste. It is the responsibility of each laboratory to handle solid and liquid waste according to their nature and degree of hazardousness and to treat and dispose of them (or have them treated and disposed of) in accordance with any applicable regulations.

Specimen

4. For collection of endocervical swab specimens, use only the BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens.
5. For patient-collection and transport of vaginal swabs, use only the Vaginal Specimen Transport for the BD ProbeTec™ Q^x Amplified DNA Assays.
6. For collection of male urethral swab specimens, use only the Male Urethral Specimen Collection Kit for the BD ProbeTec™ Q^x Amplified DNA Assays.
7. For urine specimens, use only the Q^x UPT or unpreserved (neat) urine.
8. Under or over filling Specimen Tubes or the Q^x UPT with urine may affect assay performance. Over filling the tubes may also result in liquid overflow on the BD Viper™ deck, and could cause contamination.
9. For male urethral and female endocervical swab specimens, specimens must be collected and tested before the expiration date of the Q^x Swab Diluent tube.
10. For vaginal specimens, specimens must be collected and processed before the expiration date of the Vaginal Specimen Transport. Once expressed, specimens must be tested before the expiration date of the Q^x Swab Diluent tube.
11. For urine specimens, specimens must be tested before the expiration date of the Q^x UPT.
12. For liquid-based cytology specimens, use only the Liquid-Based Cytology Specimen (LBC) Dilution Tube for the BD ProbeTec™ Q^x Amplified DNA Assays.
13. Liquid-based cytology solutions contain flammable substances. Do not place specimens transferred to the LBC Specimen Dilution Tubes in the BD Viper™ Lysing Rack or the Lysing Heater. Specimens transferred to the LBC Specimen Dilution Tubes should be placed in the BD Viper™ LBC Specimen Rack.
14. For testing with the BD ProbeTec™ CT/GC Q^x Amplified DNA Assays on the BD Viper™ System in Extracted Mode, be sure to obtain aliquots of specimens collected in BD SurePath™ Preservative Fluid or PreservCyt™ Solution prior to processing for either the BD SurePath™ or ThinPrep™ Pap test. Failure to do so may result in erroneous results.
15. The BD ProbeTec™ CT/GC Q^x Amplified DNA Assays may not be used with BD SurePath™ or PreservCyt™ residual specimens.
16. Do not run PreservCyt™ specimens that have been treated with glacial acetic acid on the BD Viper™ System in Extracted Mode. Extraction Control failures or False Negative results may occur.
17. Use only polypropylene aerosol-resistant pipette tips to transfer specimens to the LBC Specimen Dilution Tubes.
18. Liquid-based cytology specimens must be tested before the expiration date of the LBC Specimen Dilution Tube.

Assay/Reagent

19. This reagent pack is for testing endocervical and patient-collected vaginal swabs (in a clinical setting), male urethral swabs, male and female urine specimens, and BD SurePath™ and PreservCyt™ specimens with the BD Viper™ System in Extracted Mode.
20. The Q^x UPT contains **NAP Guard** (approximately 742.5 mM K_2EDTA).
21. Use only sample and control tubes with pierceable caps on the BD Viper™ System in Extracted Mode. Do not remove pierceable caps prior to running the instrument. Be sure to replace any punctured pierceable caps with new pierceable caps prior to running the instrument.
22. Do not interchange or mix kit reagents from kits with different lot numbers.

23. The Q^x Swab Diluent for the BD ProbeTec™ Q^x Amplified DNA Assays contains dimethyl sulfoxide (DMSO). DMSO is harmful by inhalation, in contact with skin and if swallowed. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.

    WARNING

    H315 Causes skin irritation. **H319** Causes serious eye irritation.
    P280 Wear protective gloves/protective clothing/eye protection/face protection. **P264** Wash thoroughly after handling. **P332+P313** If skin irritation occurs: Get medical advice/attention. **P362** Take off contaminated clothing. **P337+P313** If eye irritation persists: Get medical advice/attention.
24. Do not test the Q^x Swab Diluent tube from the Endocervical/Lesion or the Male Urethral Specimen Collection Kits if received in the laboratory without the swab present. A false negative test result may occur.
25. Use only the BD Viper™ pipette tips as supplied by BD with the BD Viper™ System.
26. The BD Viper™ Extraction Reagent and Lysis Troughs contain corrosive substances. These solutions have a strong caustic effect, and may cause severe burns to skin and mucous membranes.

    DANGER

    H302 Harmful if swallowed. **H314** Causes severe skin burns and eye damage. **H317** May cause an allergic skin reaction. **H350** May cause cancer. **H411** Toxic to aquatic life with long lasting effects.

    P201 Obtain special instructions before use. **P202** Do not handle until all safety precautions have been read and understood. **P260** Do not breathe dust/fume/gas/mist/vapors/spray. **P261** Avoid breathing dust/fume/gas/mist/vapors/spray. **P264** Wash thoroughly after handling. **P270** Do not eat, drink or smoke when using this product. **P272** Contaminated work clothing should not be allowed out of the workplace. **P273** Avoid release to the environment. **P280** Wear protective gloves/protective clothing/eye protection/face protection. **P281** Use personal protective equipment as required. **P301+P312** IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. **P301+P330+P331** IF SWALLOWED: rinse mouth. Do NOT induce vomiting. **P303+P361+P353** IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. **P304+P340** IF INHALED: Remove person to fresh air and keep comfortable for breathing. **P305+P351+P338** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. **P302+P352** IF ON SKIN: Wash with plenty of soap and water. **P310** Immediately call a POISON CENTER or doctor/physician. **P321** Specific treatment (see on this label). **P333+P313** If skin irritation or rash occurs: Get medical advice/attention. **P363** Wash contaminated clothing before reuse. **P391** Collect spillage. **P405** Store locked up. **P501** Dispose of contents/container in accordance with local/regional/national/international regulations.

    EUH210: Safety data sheet available on request.
27. Use **only the** BD Viper™ Amplification Plate Sealers (Black) on the Amplification plates with the BD Viper™ System. Using the clear sealers for sealing the Amplification plates may cause erroneous results.
28. Reagent pouches containing unused Priming Microwells and Amplification Microwells MUST be carefully resealed after opening. Verify that desiccant is present prior to resealing the reagent pouches.
29. Because the CT/GC Q^x Positive control is used for both CT Q^x and GC Q^x testing, correct positioning of the microwell strips is important for final results reporting.
30. The plate containing the Amplification Microwells MUST be properly sealed with the BD Viper™ Amplification Plate Sealer (Black) prior to moving the plate from the BD Viper™ System. Sealing ensures a closed reaction for amplification and detection and is necessary to avoid contamination of the instrument and work area with amplification products. **Do not remove sealing material from microwells at any time.**
31. Priming Microwells with residual fluid (after transfer of liquid from the Priming Microwells to the Amplification Microwells) represent a source of target contamination. Carefully seal Priming Microwells with plate sealer prior to disposal.
32. To prevent contamination of the work environment with amplification products, use the disposal bags provided in the Accessory kit to dispose of tested Amplification Microwells. Make sure the bags are properly closed before disposal.
33. Although dedicated work areas are not required because the BD Viper™ design reduces the possibility of amplicon contamination in the testing environment, other precautions for controlling contamination, particularly to avoid contamination of specimens during manipulation, are necessary.
34. CHANGE GLOVES if they come in contact with specimen or appear to be wet, to avoid contaminating other specimens. Change gloves before leaving work area and upon entry into work area.

35. In the event of contamination of the work area or equipment with specimens or controls, thoroughly clean the contaminated area with 3% (w/v) hydrogen peroxide (do not use hydrogen peroxide from a bottle that has remained open for longer than 8 days), 1% (v/v) sodium hypochlorite, or DNA *AWAY*™ and rinse thoroughly with water. Allow surface to dry completely before proceeding.
36. In case of a spill on the BD Viper™ Lysing Rack, immerse the rack in 1% (v/v) sodium hypochlorite for 1–2 minutes. Do not exceed 2 minutes. Thoroughly rinse the rack with water and allow to air dry.
37. Clean the entire work area – counter tops and instrument surfaces – with 3% (w/v) hydrogen peroxide (do not use hydrogen peroxide from a bottle that has remained open for longer than 8 days), 1% (v/v) sodium hypochlorite, or DNA *AWAY*™ on a daily basis. Thoroughly rinse with water. Allow surfaces to dry completely before proceeding with additional testing.
38. Contact BD Technical Service and Support in the event of an unusual situation, such as a spill into the BD Viper™ instrument or DNA contamination that cannot be removed by cleaning.
39. Acid and Base spill kits should be on hand in the event of a spill of extraction reagents.

SWAB SPECIMEN COLLECTION, STORAGE AND TRANSPORT

For swab specimens, performance data in this package insert have been established with the BD ProbeTec™ collection kits listed. Performance with collection devices other than those listed has not been evaluated.

- BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens
- Vaginal Specimen Transport for the BD ProbeTec™ Q^x Amplified DNA Assays
- Male Urethral Specimen Collection Kit for the BD ProbeTec™ Q^x Amplified DNA Assays

Swab Specimen Collection

Endocervical Swab Specimen Collection using BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens

1. Remove the cleaning swab from packaging.
2. Using the polyester fiber-tipped cleaning swab with the white shaft, remove excess blood and mucus from the cervical os.
3. Discard the used cleaning swab.
4. Remove the pink collection swab from packaging.
5. Insert the collection swab into the cervical canal and rotate for 15–30 seconds.
6. Withdraw the swab carefully. Avoid contact with the vaginal mucosa.
7. Uncap the Q^x Swab Diluent tube.
8. Fully insert the collection swab into the Q^x Swab Diluent tube.
9. Break the shaft of the swab at the score mark. Use care to avoid splashing of contents.
10. **Tightly** recap the tube.
11. Label the tube with patient information and date/time collected.
12. Transport to laboratory.

Vaginal Swab Patient Collection Procedure using Vaginal Specimen Transport for the BD ProbeTec™ Q^x Amplified DNA Assays

NOTE: Ensure that patients read the Patient Collection Instructions before providing them with a collection kit.

1. Wash hands with soap and water. Rinse and dry.
2. It is important to maintain a comfortable balance during the collection procedure.
3. Twist the cap to break the seal. Pull the cap with attached swab from the tube. Do not touch the soft tip or lay the swab down. If you touch or drop the swab tip or the swab is laid down, discard the swab and request a new vaginal swab.
4. Hold the swab by the cap with one hand so that the swab tip is pointing toward you.
5. With your other hand, gently spread the skin outside the vagina. Insert the tip of the swab into the vaginal opening. Point the tip toward your lower back and relax your muscles.
6. Gently slide the swab no more than 2 inches into the vagina. If the swab does not slide easily, gently rotate the swab as you push. **If it is still difficult, do not attempt to continue.** Make sure the swab touches the walls of the vagina so that moisture is absorbed by the swab.
7. Rotate the swab for 10–15 seconds.
8. Withdraw the swab without touching the skin. Place the swab in the tube and cap securely.
9. After collection, wash hands with soap and water, rinse, and dry.
10. Return the tube with the swab to the nurse or clinician as instructed.
11. Label with patient information and date/time collected.
12. Transport to laboratory.

Male Urethral Swab Specimen Collection using Male Urethral Specimen Collection Kit for the BD ProbeTec™ Q^x Amplified DNA Assays

1. Remove the swab from packaging.
2. Insert the swab 2–4 cm into the urethra and rotate for 3–5 seconds.
3. Withdraw the swab.
4. Uncap the Q^x Swab Diluent tube.
5. Fully insert the collection swab into the Q^x Swab Diluent tube.
6. Break the shaft of the swab at the score mark. Use care to avoid splashing of contents.

7. **Tightly** recap the tube.
8. Label the tube with patient information and date/time collected.
9. Transport to laboratory.

Swab Storage and Transport

Table 1 provides instructions for storage and transport conditions to the laboratory and/or test site for swab specimens. The endocervical and the male urethral swab specimens must be stored and transported to the laboratory and/or test site within 30 days after collection if kept at 2–30 °C or within 180 days after collection if kept frozen at -20 °C. Patient-collected vaginal swab specimens must be stored and transported to the laboratory and/or test site within 14 days after collection if kept at 2–30 °C or within 180 days after collection if kept frozen at -20 °C. Patient-collected vaginal swab specimens that are expressed in Q^x Swab Diluent may be stored and processed within 30 days after expression if kept at 2–30 °C or within 180 days after the date of expression if kept frozen at -20 °C.

Table 1: Swab Specimen Storage and Transport

Swab Specimen Type To Be Processed	Female Endocervical Swab Specimen/ Male Urethral Swab Specimen		Vaginal Swab Specimen			
			Dry Vaginal Swab Specimen (Collection Site)		Expressed Vaginal Swab Specimen (Test Site)	
Temperature Condition for Transport to Test Site and Storage	2–30 °C	-20 °C	2–30 °C	-20 °C	2–30 °C	-20 °C
Process Specimen According to Instructions	Within 30 days of collection	Within 180 days of collection	Express and process within 14 days of collection	Express and process within 180 days of collection	Within 30 days of expression	Within 180 days of expression

For U.S. and international shipments, specimens should be labeled in compliance with applicable state, federal, and international regulations covering the transport of clinical specimens and etiologic agents/infectious substances. Time and temperature conditions for storage must be maintained during transport.

URINE SPECIMEN COLLECTION, STORAGE AND TRANSPORT

For urine specimens, performance has been established with the Q^x UPT and with urine collected in a sterile, plastic, preservative-free, specimen collection cup (i.e., neat urine without preservatives). Performance with other collection methods and collection devices has not been established.

Urine Specimen Collection

1. The patient should not have urinated for at least 1 hour prior to specimen collection.
2. Collect the specimen in a sterile, preservative-free specimen collection cup.
3. The patient should collect the first 20–60 mL of voided urine (the first part of the stream – NOT midstream) into a urine collection cup.
4. Cap and label with patient identification and date/time collected.

Urine Transfer to Q^x UPT

NOTE: Urine specimens should be transferred from the collection cup to the Q^x UPT within 8 hour of collection if the urine specimen has been stored at 2–30 °C. Urine Specimens stored at 2–8 °C can be held up to 24 hour prior to transfer to the Q^x UPT.

Wear clean gloves when handling the Q^x UPT tube and urine specimen. If gloves come in contact with the specimen, immediately change them to prevent contamination of other specimens.

1. Open the Q^x UPT Collection and Transport Kit and remove the Q^x UPT and transfer pipette from their packaging.
2. Label the Q^x UPT with the patient identification and date/time collected.
3. Hold the Q^x UPT upright and firmly tap the bottom of the tube on a flat surface to dislodge any large drops from inside the cap. Repeat if necessary.
4. Uncap the Q^x UPT and use the transfer pipette to dispense urine into the tube. The correct volume of urine has been added when the fluid level is between the purple lines on the fill window located on the Q^x UPT label. This volume corresponds to approximately 2.0–3.0 mL of urine. DO NOT overfill or under fill the tube.
5. Discard the transfer pipette in a biohazard waste container.

NOTE: The transfer pipette is intended for use with a single specimen.

6. Tighten the cap securely on the Q^x UPT.
7. Invert the Q^x UPT 3–4 times to ensure that the specimen and reagent are well mixed.

Q^x UPT Urine Storage and Transport

Store and transport Q^x UPT urine specimens at 2–30 °C and pre-warm them within 30 days of transfer to the Q^x UPT. Specimens may be stored in the Q^x UPT at -20 °C for up to 180 days prior to pre-warming.

Neat Urine Storage and Transport

Store and transport neat urine specimens from the collection site to the test site at 2–8 °C and pre-warm them within 7 days of collection. Neat urine stored at 2–30 °C must be pre-warmed within 30 hours of collection. Neat urine specimens may also be stored frozen at -20 °C for up to 180 days prior to pre-warming.

Table 2: Urine Specimen Storage and Transport

Urine Specimen Type to be Processed	Q^x UPT			NEAT		
Urine Handling Options Prior To Transfer To Q^x UPT	Store urine specimen at 2–30 °C and transfer to Q^x UPT within 8 hours of collection or Store urine specimen at 2–8 °C and transfer to Q^x UPT within 24 hours of collection or Transfer to Q^x UPT immediately					
Temperature Condition for Storage and Transport to Test Site	2–8 °C	2–30 °C	-20 °C	2–8 °C	2–30 °C	-20 °C
Process and Test Specimen According to Instructions	Within 30 days after transfer to Q^x UPT		Within 180 days after transfer to Q^x UPT	Within 7 days of collection	Within 30 hours of collection	Within 180 days of collection

LBC SPECIMEN COLLECTION, STORAGE AND TRANSPORT

BD SurePath™ or PreservCyt™ specimens must be collected using either an endocervical broom or a brush/spatula combination as described in the BD SurePath™ or PreservCyt™ product insert. Once collected, BD SurePath™ or PreservCyt™ specimens can be stored and transported in their original vials for up to 30 days at 2–30 °C prior to transfer to LBC Specimen Dilution Tubes.

Specimen Transfer to LBC Specimen Dilution Tubes

A 0.5 mL aliquot of either the BD SurePath™ or PreservCyt™ specimen must be transferred from the original vial to the LBC Specimen Dilution Tube prior to processing for either the BD SurePath™ or ThinPrep™ Pap test.

Wear gloves when handling the LBC Specimen Dilution Tube and the BD SurePath™ or PreservCyt™ specimen vial. If gloves come in contact with the specimen, immediately change them to prevent contamination of other specimens.

BD SurePath™ Specimen Transfer

NOTE: Refer to the BD PrepStain™ Slide Processor Product Insert for instructions on removing an aliquot from the BD SurePath™ specimen vial prior to performing the BD SurePath™ liquid-based Pap test.

1. Label an LBC Specimen Dilution Tube with patient identification information.
2. Remove the cap from the LBC Specimen Dilution Tube.
3. Transfer 0.5 mL from the specimen vial to the LBC Specimen Dilution Tube. Avoid pipetting fluid from the bottom of the vial. Discard pipette tip.

   NOTE: A separate pipette tip must be used for each specimen.
4. Tighten the cap on the LBC Specimen Dilution Tube securely.
5. Invert the LBC Specimen Dilution Tube 3–4 times to ensure that the specimen and diluent are well mixed.

PreservCyt™ Specimen Transfer

NOTE: Refer to the ThinPrep™ 2000/3000 System Operator's Manual Addendum for instructions on removing an aliquot from the PreservCyt™ specimen vial prior to performing the ThinPrep™ Pap test.

1. Label an LBC Specimen Dilution Tube with patient identification information.
2. Remove the cap from the LBC Specimen Dilution Tube.
3. Transfer 0.5 mL from the specimen vial to the LBC Specimen Dilution Tube. Avoid pipetting fluid from the bottom of the vial. Discard pipette tip.

   NOTE: A separate pipette tip must be used for each specimen.
4. Tighten the cap on the LBC Specimen Dilution Tube securely.
5. Invert the LBC Specimen Dilution Tube 3–4 times to ensure that the specimen and diluent are well mixed.

Storage and Transport of Specimens Transferred to the LBC Specimen Dilution Tubes

After transfer to an LBC Specimen Dilution Tube the diluted specimen can be stored at 2–30 °C for up to 30 days. Diluted specimens may also be stored at -20 °C for up to 90 days.

SWAB SPECIMEN PROCESSING

Processing procedure for the BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens or the Male Urethral Specimen Collection Kit for the BD ProbeTec™ Q^x Amplified DNA Assays

NOTE: If specimens are refrigerated or frozen, make sure they are brought to room temperature and mixed by inversion prior to proceeding.

1. Using the tube layout report, place the Q^x Swab Diluent tube with **black pierceable cap** in order in the BD Viper™ Lysing Rack and lock into place.
2. Repeat step 1 for additional swab specimens.
3. Specimens are ready to be pre-warmed.
4. **Change gloves** before proceeding to avoid contamination.

Processing procedure for the Vaginal Specimen Transport for the BD ProbeTec™ Q^x Amplified DNA Assays

NOTE: Wear clean gloves when handling the vaginal swab specimen. If gloves come in contact with specimen, immediately change them to prevent contamination of other specimens.

NOTE: If specimens are refrigerated or frozen, make sure they are brought to room temperature prior to expression.

1. Label a pre-filled Q^x Swab Diluent tube for each swab specimen to be processed.
2. Remove the cap and insert the swab specimen into the Q^x Swab Diluent. Mix by swirling the swab in the Q^x Swab Diluent for 5–10 seconds.
3. Express the swab along the inside of the tube so that liquid runs back into the bottom of the tube.
4. Remove the swab carefully from the Q^x Swab Diluent tube to avoid splashing.
5. Place the expressed swab back into the transport tube and discard with biohazardous waste.
6. Tightly recap the Q^x Swab Diluent tube with the **black pierceable cap**.
7. Repeat steps 1–6 for additional swab specimens.
8. Using the tube layout report, place the tube in order in the BD Viper™ Lysing Rack and lock into place.
9. Specimens are ready to be pre-warmed.
10. **Change gloves** before proceeding to avoid contamination.

URINE SPECIMEN PROCESSING

NOTE: If specimens are refrigerated or frozen, make sure they are brought to room temperature and mixed by inversion prior to proceeding.

Processing procedure for the Q^x UPT

1. Make sure the urine volume in each Q^x UPT tube falls between the lines indicated on the tube label. Under or over filling the tube may affect assay performance. Over filling the tube may also result in liquid overflow on the BD Viper™ deck, and could cause contamination.
2. Make sure the Q^x UPT tube has a **black pierceable cap**.
3. Repeat steps 1 and 2 for additional Q^x UPT tube specimens.
4. Using the tube layout report, place the Q^x UPT tube in order in the BD Viper™ Lysing Rack and lock into place.
5. Specimens are ready to be pre-warmed.
6. **Change gloves** before proceeding to avoid contamination.

Processing procedure for unpreserved (Neat) urine specimens

NOTE: Wear clean gloves when handling the urine specimen. If gloves come in contact with specimen, immediately change them to prevent contamination of other specimens.

1. Label a Specimen Tube for use on the BD Viper™ System (Extracted Mode) with the patient identification and date/time collected.
2. Swirl the urine cup to mix the urine specimen and open carefully.

   NOTE: Open carefully to avoid spills which may contaminate gloves or the work area.
3. Uncap the tube and use a pipette to transfer the urine specimen into the tube. The correct volume of urine has been added when the fluid level is between the purple lines on the fill window located on the label. This volume corresponds to approximately 2.0–3.0 mL of urine. DO NOT overfill or under fill the tube.
4. Tighten a **black pierceable cap** securely on each tube.
5. Repeat steps 1 through 4 for each urine specimen. Use a new pipette or pipette tip for each sample.
6. Using the tube layout report, place the neat urine specimens in order in the BD Viper™ Lysing Rack and lock into place.
7. Specimens are ready to be pre-warmed.
8. **Change gloves** before proceeding to avoid contamination.

NOTE: The pre-warm step must be started within 30 h of collection if the urine has been stored at 2–30 °C; within 7 days of collection if stored at 2–8 °C; or within 180 days if stored frozen at -20 °C.

PROCESSING PROCEDURE FOR LBC SPECIMENS TRANSFERRED TO THE LBC SPECIMEN DILUTION TUBES

NOTE: Do not place specimens transferred to the LBC Specimen Dilution Tubes in the BD Viper™ Lysing Rack or the BD Viper™ Lysing Heater. Specimens transferred to the LBC Specimen Dilution Tubes should be placed in the BD Viper™ LBC Specimen Rack.

NOTE: If specimens are frozen, make sure they are thawed completely at room temperature and mixed by inversion prior to proceeding.

1. Make sure the LBC Specimen Dilution Tube has a blue pierceable cap.
2. Using the tube layout report, place the LBC Specimen Dilution Tube containing the specimen in order in the BD Viper™ LBC Specimen Rack and lock into place.
3. Specimens are ready to be tested on the BD Viper™ System in Extracted Mode.
4. Change gloves prior to proceeding to avoid contamination.

QUALITY CONTROL PREPARATION

NOTE: Do not re-hydrate the controls prior to loading in the BD Viper™ Lysing Rack.

1. Using the tube layout report, place CT/GC Q^x Negative Controls into the appropriate positions in the BD Viper™ Lysing Rack.
2. Using the tube layout report, place CT/GC Q^x Positive Controls into the appropriate positions in the BD Viper™ Lysing Rack.
3. Controls are ready to be pre-warmed with the specimens if desired.

PRE-WARM PROCEDURE FOR SWAB AND URINE SPECIMENS

NOTE: The pre-warm procedure must be applied to all swab and urine specimens to ensure that the specimen matrix is homogeneous prior to loading on the BD Viper™ System. Failure to pre-warm specimens may have an adverse impact on performance of the BD ProbeTec™ CT/GC Q^x assays and/or BD Viper™ System. Swab and urine specimens must be pre-warmed; however, pre-warming of the controls is optional.

NOTE: Refrigerated or frozen specimens must be brought to room temperature prior to pre-warming.

1. Insert the BD Viper™ Lysing Rack into the BD Viper™ Lysing Heater.
2. Pre-warm the specimens for 15 minutes at 114 +/- 2 °C.
3. Remove the Lysing Rack from the Lysing Heater and let specimens cool at room temperature for a minimum of 15 minutes before loading into the BD Viper™ instrument.
4. Refer to the Test Procedure for testing specimens and controls.
5. After pre-warming, specimens may be stored for 7 days at 2–30 °C or for 180 days at -20 °C without additional pre-warming prior to testing on the BD Viper™ System.

TEST PROCEDURE

Refer to the BD Viper™ Instrument User's Manual (Extracted Mode Operation) for specific instructions for operating and maintaining the components of the system. The optimum environmental conditions for the GC Q^x assay were found to be 18–27 °C and 20–85% Relative Humidity.

QUALITY CONTROL

Quality control must be performed in accordance with applicable local, state and/or federal regulations or accreditation requirements and your laboratory's standard Quality Control procedures. It is recommended that the user refer to pertinent CLSI guidance and CLIA regulations for appropriate Quality Control practices.

The Control Set for the BD ProbeTec™ CT/GC Q^x Amplified DNA Assays is provided separately. One Positive and one Negative Control must be included in each assay run and for each new reagent kit lot number. Controls must be positioned according to the BD Viper™ Instrument User's Manual. The CT/GC Q^x Positive Control will monitor for substantial reagent failure only. The CT/GC Q^x Negative Control monitors for reagent and/or environmental contamination. Additional controls may be tested according to guidelines or requirements of local, state, and/or federal regulations or accrediting organizations. Refer to CLSI C24-A3 for additional guidance on appropriate internal quality control testing practices.[14] The Positive Control contains approximately 2,400 copies per mL of pCTB4 and pGCint3 linearized plasmids.

The Extraction Control (EC) oligonucleotide is used to confirm the validity of the extraction process. The EC is dried in the Extraction Tubes and is re-hydrated by the BD Viper™ System upon addition of the specimen and extraction reagents. At the end of the extraction process, the EC fluorescence is monitored by the instrument and an automated algorithm is applied to both the EC and *N. gonorrhoeae*-specific signals to report specimen results as positive, negative, or EC failure.

General QC Information for the BD Viper™ System

The location of the microwells is shown in a color-coded plate layout screen on the LCD Monitor. The plus symbol (+) within the microwell indicates the positive QC sample. The minus symbol (-) within the microwell indicates the negative QC sample.

A QC pair must be logged in for each reagent kit lot number and for each plate to be tested. If QC pairs have not been properly logged in, a message box appears that prevents saving the rack and proceeding with the run until complete. A maximum of two QC pairs per rack is permitted. Additional control materials may be added provided they are logged in as samples.

NOTE: The BD Viper™ System will re-hydrate the controls during the assay run. Do not attempt to hydrate the assay controls prior to loading them into the BD Viper™ Lysing Rack.

Running one plate on a BD Viper™ System

The first two positions (A1 and B1) are reserved for the positive (A1) and negative (B1) controls, respectively. The first available position for a patient sample is C1.

Running two plates on a BD Viper™ System

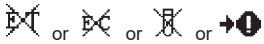
For plate one, the first two positions (A1 and B1) are reserved for the positive (A1) and negative (B1) controls, respectively. The first available position for a patient sample is C1. For plate two (full plate) the last two positions (G12 and H12) are reserved for the positive (G12) and negative (H12) controls, respectively. For plate two (partial plate) the last two positions after the last patient sample are automatically assigned as the positive and negative controls, respectively.

Interpretation of Quality Control Results

The CT/GC Q^x Positive Control and the CT/GC Q^x Negative Control must test as positive and negative, respectively, in order to obtain patient results. If controls do not perform as expected, the run is considered invalid and patient results will not be reported by the instrument. If either of the controls does not provide the expected results, repeat the entire run using a new set of controls, new extraction tubes, new extraction reagent trough, new lysis trough and new microwells. If the repeat QC does not provide the expected results, contact BD Technical Services.

If the *N. gonorrhoeae*-specific signal is greater than or equal to a threshold of 125 Maximum Relative Fluorescent Units (MaxRFU), the EC fluorescence is ignored by the algorithm. If the *N. gonorrhoeae*-specific signal is less than a threshold of 125 MaxRFU, the EC fluorescence is utilized by the algorithm in the interpretation of the result.

Table 3: Interpretation of Quality Control Results

Control Type	Tube Result Report Symbol	GC Q^x MaxRFU	QC Disposition
GC Q^x Positive Control	OK	≥125	QC Pass
GC Q^x Positive Control		<125	QC Failure
GC Q^x Positive Control		Any value	QC Failure
GC Q^x Negative Control	OK	<125	QC Pass
GC Q^x Negative Control		≥125	QC Failure
GC Q^x Negative Control		Any value	QC Failure

Refer to the Interpretation of Test Results for a description of Tube Result Report symbols.

INTERPRETATION OF TEST RESULTS

The BD ProbeTec™ GC Q^x Amplified DNA Assay uses fluorescent energy transfer as the detection method to test for the presence of *N. gonorrhoeae* in clinical specimens. All calculations are performed automatically by the BD Viper™ software.

The presence or absence of *N. gonorrhoeae* DNA is determined by calculating the peak fluorescence (MaxRFU) over the course of the amplification process and by comparing this measurement to a predetermined threshold value. The magnitude of the MaxRFU score is not indicative of the level of organism in the specimen. If the *N. gonorrhoeae*-specific signal is greater than or equal to a threshold of 125 MaxRFU, the EC fluorescence is ignored by the algorithm. If the *N. gonorrhoeae*-specific signal is less than a threshold of 125 MaxRFU, the EC fluorescence is utilized by the algorithm in the interpretation of the result. If assay control results are not as expected, patient results are not reported. See the Quality Control section for expected control values. Reported results are determined as follows.

Table 4: Interpretation of Test Results for the GC Q^x Assay

Tube Report Result	GC Q^x MaxRFU	Report	Interpretation	Result
	≥125	*N. gonorrhoeae* plasmid DNA detected by SDA.	Positive for *N. gonorrhoeae*. *N. gonorrhoeae* organism viability and/or infectivity cannot be inferred since target DNA may persist in the absence of viable organisms.	Positive
	<125	*N. gonorrhoeae* plasmid DNA not detected by SDA.	Presumed negative for *N. gonorrhoeae*. A negative result does not preclude *N. gonorrhoeae* infection because results are dependent on adequate specimen collection, absence of inhibitors, and the presence of sufficient DNA to be detected.	Negative
	<125	Extraction control failure. Repeat test from initial specimen tube or obtain another specimen for testing.	*N. gonorrhoeae*, if present, is not detectable.	Extraction Control Failure
	Any value	Extraction Transfer Failure. Repeat test from initial specimen tube or obtain another specimen for testing.	*N. gonorrhoeae*, if present, is not detectable.	Extraction Transfer Failure
	Any value	Liquid Level Failure. Repeat test from initial specimen tube or obtain another specimen for testing.	*N. gonorrhoeae,* if present, is not detectable.	Liquid Level Failure
	Any value	Error. Repeat test from initial specimen tube or obtain another specimen for testing.	*N. gonorrhoeae*, if present, is not detectable.	Error

SPECIMEN PROCESSING CONTROLS

Specimen Processing Controls may be tested in accordance with the requirements of appropriate accrediting organizations. A positive Specimen Processing Control tests the entire assay system. For this purpose, known positive specimens can serve as controls by being processed and tested in conjunction with unknown specimens. Specimens used as processing controls must be stored, processed, and tested according to the package insert. If a known positive specimen is not available, additional options for Specimen Processing Controls are described below:

A. Preparation of Specimen Processing Controls in BD ProbeTec™ Q^x Swab Diluent

ATCC *Neisseria gonorrhoeae*

Assay a stock culture of *N. gonorrhoeae* prepared as described below:

1. Thaw a vial of *N. gonorrhoeae* stock culture, received from ATCC and immediately inoculate a chocolate agar plate.
2. Incubate at 37 °C in 3–5% CO_2 for 24–48 hours.
3. Resuspend colonies from the chocolate agar plate with phosphate buffered saline (PBS).
4. Dilute cells in PBS to a 1.0 McFarland turbidity standard (approximately 3 x 10^8 cells/mL).
5. Prepare 10-fold serial dilutions to a 10^{-5} dilution of the McFarland (at least 4 mL final volume) in PBS.
6. Place 0.1 mL of the 10^{-5} dilution in a BD ProbeTec™ Q^x Swab Diluent tube and tightly recap using a **black pierceable cap**.
7. Using the tube layout report, place the Specimen Processing Control(s) in order in the BD Viper™ Lysing Rack and lock into place.
8. Process the controls according to the Pre-warming Procedure and then follow the Test Procedure.

Bio-Rad AmpliTrol - *Chlamydia trachomatis* & *Neisseria gonorrhoeae*

NOTE: Refer to manufacturer's processing instructions.

1. Add the appropriate volume of Bio-Rad AmpliTrol CT/GC to a BD ProbeTec™ Q^x Swab Diluent tube and tightly recap using a **black pierceable cap**.
2. Mix the solution by vortexing or with inversion.
3. Using the tube layout report, place the Specimen Processing Control(s) in order in the BD Viper™ Lysing Rack and lock into place.
4. Process the controls according to the Pre-warming Procedure and then follow the Test Procedure.

B. Preparation of Specimen Processing Controls in LBC Specimen Dilution Tubes

ATCC *Neisseria gonorrhoeae*

1. Grow *N. gonorrhoeae* culture overnight on chocolate agar plates.
2. Resuspend *N. gonorrhoeae* colonies in phosphate buffered saline (PBS).
3. Prepare a McFarland #1 turbidity standard from the resuspended colonies.
4. Prepare 10-fold serial dilutions of the McFarland #1 suspension to 10^{-5}.
5. Add 0.1 mL of 10^{-5} dilution of *N. gonorrhoeae* to an LBC Specimen Dilution Tube containing 0.5 mL of BD SurePath™ Preservative Fluid or PreservCyt™ Solution. Tightly recap the LBC Specimen Dilution Tube using the blue pierceable cap.
6. Invert the LBC Specimen Dilution Tube 3–4 times to ensure that the contents are well mixed.
7. Using the tube layout report, place the Specimen Processing Control(s) in order in the BD Viper™ LBC Specimen Rack and lock into place.
8. Specimen Processing Controls are ready to be tested on the BD Viper™ System in Extracted Mode.
9. Change gloves prior to proceeding to avoid contamination.

ATCC *Chlamydia trachomatis* and *Neisseria gonorrhoeae*

1. Thaw vial of *C. trachomatis* LGV II or serovar H cells received from ATCC.
2. Prepare 10-fold serial dilutions to 10^{-5} in PBS.
3. Grow *N. gonorrhoeae* culture overnight on chocolate agar plates.
4. Resuspend *N. gonorrhoeae* colonies in PBS.
5. Prepare a McFarland #1 turbidity standard from the resuspended colonies.
6. Prepare 10-fold serial dilutions of the McFarland #1 suspension to 10^{-5}.
7. Add 0.1 mL of 10^{-5} dilution of *C. trachomatis* and 0.1 mL of 10^{-5} dilution of *N. gonorrhoeae* to an LBC Specimen Dilution Tube containing 0.5 mL of BD SurePath™ Preservative Fluid or PreservCyt™ Solution. Tightly recap the LBC Specimen Dilution Tube using the blue pierceable cap.
8. Invert the LBC Specimen Dilution Tube 3–4 times to ensure that the contents are well mixed.
9. Using the tube layout report, place the Specimen Processing Control(s) in order in the BD Viper™ LBC Specimen Rack and lock into place.
10. Specimen Processing Controls are ready to be tested on the BD Viper™ System in Extracted Mode.
11. Change gloves prior to proceeding to avoid contamination.

Bio-Rad AmpliTrol *Chlamydia trachomatis* and *Neisseria gonorrhoeae*

NOTE: Refer to manufacturer's processing instructions.

1. Add the appropriate volume of Bio-Rad AmpliTrol CT/GC to an LBC Specimen Dilution Tube containing 0.5 mL of BD SurePath™ Preservative Fluid or PreservCyt™ Solution. Tightly recap the LBC Specimen Dilution Tube using the blue pierceable cap.
2. Invert the LBC Specimen Dilution Tube 3–4 times to ensure that the contents are well mixed.
3. Using the tube layout report, place the Specimen Processing Control(s) in order in the BD Viper™ LBC Specimen Rack and lock into place.
4. Specimen Processing Controls are ready to be tested on the BD Viper™ System in Extracted Mode.
5. Change gloves prior to proceeding to avoid contamination.

MONITORING FOR THE PRESENCE OF DNA CONTAMINATION

At least monthly, the following test procedure should be performed to monitor the work area and equipment surfaces for the presence of DNA contamination. Environmental monitoring is essential to detect contamination prior to the development of a problem.

1. For each area to be tested, use a clean collection swab from the BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens.
2. Dip the swab into the BD ProbeTec™ Q^x Swab Diluent tube and wipe the first area* using a broad sweeping motion.
3. Fully insert the collection swab into the Q^x Swab Diluent tube.
4. Break the shaft of the swab at the score mark. Use care to avoid splashing of contents.
5. Tightly recap the tube using the **black pierceable cap**.
6. Repeat for each desired area.
7. After all swabs have been collected, expressed in diluent, process according to the Pre-warming Procedure and then follow the Test Procedure.

*Recommended areas to test include

Instrument deck

Pipette Tip Station Covers (2); Tube Processing Station: Tube Alignment Block and Fixed Metal Base; Deck Waste Area, Priming and Warming Heaters/Stage; Extraction Block; Plate Sealing Tool; Tip Exchange Stations (2);

Instrument Exterior

Upper Door Handle; Lower Door Handle; Waste Liquid Quick Release Valve; LCD Monitor (Touchscreen); Keyboard/Scanner; Staging Area; Locking Plate and Fixed Metal Base;

Accessories

Tube Lockdown cover, BD Viper™ Lysing Rack/Table Base; BD Viper™ Lysing Heater; Metal Microwell Plates; Timer; Laboratory Bench Surfaces.

If an area gives a positive result or if contamination is suspected, clean the area with fresh 1% (v/v) sodium hypochlorite, DNA *AWAY*, or 3% (w/v) hydrogen peroxide. (Do not use hydrogen peroxide from a bottle that has remained open for longer than 8 days). Make sure the entire area is wetted with the solution and allowed to remain on the surface for at least 2 min or until dry. If necessary, remove excess cleaning solution with a clean towel. Wipe the area with a clean towel saturated with water and allow the surface to dry. Retest the area. Repeat cleaning process until negative results are obtained. If the contamination does not resolve, contact BD Technical Service and Support for additional information.

LIMITATIONS OF THE PROCEDURE

1. This method has been tested only with endocervical, vaginal, male urethral swab specimens, BD SurePath™ or PreservCyt™ specimens collected with cytobrush/spatula or broom device, and male and female urine specimens. Performance with other specimen types has not been assessed.
2. Optimal performance of the test requires adequate specimen collection and handling. Refer to the "Specimen Collection and Transport" sections of this insert.
3. Endocervical specimen adequacy can only be assessed by microscopic visualization of columnar epithelial cells in the specimen.
4. Collection and testing of urine specimens with the BD ProbeTec™ GC Q^x Amplified DNA Assay is not intended to replace cervical exam and endocervical sampling for diagnosis of urogenital infection. Cervicitis, urethritis, urinary tract infections and vaginal infections may result from other causes or concurrent infections may occur.
5. The BD ProbeTec™ GC Q^x Amplified DNA Assay for male and female urine specimen testing should be performed on first catch random urine specimens (defined as the first 20–60 mL of the urine stream).
6. The effects of other potential variables such as vaginal discharge, use of tampons, douching, and specimen collection variables have not been determined.
7. A negative test result does not exclude the possibility of infection because test results may be affected by improper specimen collection, technical error, specimen mix-up, concurrent antibiotic therapy, or the number of organisms in the specimen which may be below the sensitivity of the test.
8. As with many diagnostic tests, results from the BD ProbeTec™ GC Q^x Amplified DNA Assay should be interpreted in conjunction with other laboratory and clinical data available to the physician.
9. The BD ProbeTec™ GC Q^x Amplified DNA Assay should not be used for the evaluation of suspected sexual abuse or for other medico-legal indications. Additional testing is recommended in any circumstance when false positive or false negative results could lead to adverse medical, social, or psychological consequences.

10. The BD ProbeTec™ GC Q^x Amplified DNA Assay cannot be used to assess therapeutic success or failure since nucleic acids from *N. gonorrhoeae* may persist following antimicrobial therapy.
11. The BD ProbeTec™ GC Q^x Amplified DNA Assay provides qualitative results. No correlation can be drawn between the magnitude of the positive assay signal (MaxRFU) and the number of cells in an infected sample.
12. The predictive value of an assay depends on the prevalence of the disease in any particular population. See Table 5 for hypothetical predictive values when testing varied populations.
13. Because the Positive Control for the BD ProbeTec™ CT/GC Q^x Amplified DNA Assays is used in testing for both *C. trachomatis* and *N. gonorrhoeae*, correct positioning of the microwell strips is important for final results reporting.
15. The reproducibility of the BD ProbeTec™ GC Q^x Amplified DNA Assay was established using seeded simulated swabs and seeded Q^x Swab Diluent to simulate urine specimens. These specimens were inoculated with either *N. gonorrhoeae* alone or *N. gonorrhoeae* plus *C. trachomatis*.
16. Performance has not been established for urine specimens in Q^x UPT when fill volumes other than those falling within the purple lines on the fill window (approximately 2.0 mL to 3.0 mL) are used.
17. The BD ProbeTec™ *Neisseria gonorrhoeae* (GC) Q^x Amplified DNA Assay may cross-react with *N. cinerea* and *N. lactamica.* These organisms have only rarely been isolated from the genital tract.[15-18] Refer to “Performance Characteristics” for further information.
18. The performance of the BD ProbeTec™ GC Q^x Amplified DNA Assay on the BD Viper™ System in extracted mode with swab specimens was evaluated for interference by blood, gynecological lubricants, and spermicides. The performance with urine specimens was evaluated for interference by blood and commonly used over-the-counter pain relievers. No interference was observed with any of the substances at the concentrations tested.
19. The patient-collected vaginal swab specimens are an option for screening women when a pelvic exam is not otherwise indicated.
20. The patient-collected vaginal swab specimen application is limited to healthcare facilities where support/counseling is available to explain procedures and precautions.
21. The BD ProbeTec™ GC Q^x Amplified DNA Assay has not been validated for vaginal swab specimens collected by patients at home.
22. The performance of vaginal swab specimens has not been evaluated in patients less than 17 years of age.
23. The performance of vaginal swab specimens has not been evaluated in pregnant women.

EXPECTED RESULTS

NOTE: An explanation of symbols and abbreviations used in tables can be found in the Interpretation of Tables section (at end of insert).

A. Prevalence

The prevalence of positive *N. gonorrhoeae* specimens in patient populations depends upon: clinic type, age, risk factors, gender, and test method. The prevalence observed with the GC Q^x Amplified DNA Assay during a multi-center clinical trial for swab and urine specimens ranged from 1.4% to 19.2% for female specimens and 4.8% to 40.5% for male specimens (Table 10A).

The prevalence observed with the GC Q^x Assay during a multi-center clinical trial for BD SurePath™ specimens ranged from 0.0% to 25.9% (Table 10B). The prevalence observed with the GC Q^x Assay during a multi-center clinical trial for PreservCyt™ specimens ranged from 0.0% to 13.3% (Table 10C).

B. Positive and Negative Predictive Value

Hypothetical positive and negative predictive values (PPV & NPV) for the GC Q^x Assay with swab and urine specimens are shown in Table 5A. Hypothetical positive and negative predictive values (PPV & NPV) for the GC Q^x Assay from the multi-center clinical trial for BD SurePath™ specimens are shown in Table 5B. Hypothetical positive and negative predictive values (PPV & NPV) for the GC Q^x Assay from the multi-center clinical trial for PreservCyt™ specimens are shown in Table 5C. These calculations are based on hypothetical prevalence and overall sensitivity and specificity (compared to the patient infected status) of 99.3% and 99.3%, for swab and urine specimens, of 100.0% and 99.9% for BD SurePath™ specimens, and of 95.3% and 99.95% for PreservCyt™ specimens. In addition, PPV and NPV based on actual prevalence, sensitivity and specificity are shown in Tables 8 and 9. PPV was calculated using: (Sensitivity x Prevalence) / (Sensitivity x Prevalence + [1 - Specificity] x [1 - Prevalence]). NPV was calculated using: (Specificity x [1 - Prevalence] / [1-Sensitivity] x Prevalence + Specificity x [1-Prevalence]).

Table 5A: GC Hypothetical Positive and Negative Predictive Values (Swabs/Urines) Compared to Patient Infected Status

Prevalence (%)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
2	99.3	99.3	74.3	100.0
5	99.3	99.3	88.2	100.0
10	99.3	99.3	94.0	99.9
20	99.3	99.3	97.3	99.8
30	99.3	99.3	98.4	99.7
40	99.3	99.3	99.0	99.5
50	99.3	99.3	99.3	99.3

Table 5B: GC Hypothetical Positive and Negative Predictive Values (BD SurePath™) Compared to Patient Infected Status

Prevalence (%)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
2	100.0	99.9	95.3	100.0
5	100.0	99.9	98.1	100.0
10	100.0	99.9	99.1	100.0
20	100.0	99.9	99.6	100.0
30	100.0	99.9	99.8	100.0
40	100.0	99.9	99.9	100.0
50	100.0	99.9	99.9	100.0

Table 5C: GC Hypothetical Positive and Negative Predictive Values (PreservCyt™) Compared to Patient Infected Status

Prevalence (%)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
2	95.3	99.95	97.5	99.9
5	95.3	99.95	99.0	99.8
10	95.3	99.95	99.5	99.5
20	95.3	99.95	99.8	98.8
30	95.3	99.95	99.9	98.0
40	95.3	99.95	99.9	97.0
50	95.3	99.95	99.9	95.5

C. MaxRFU Frequency Distribution

A total of 6,284 GC Q^x Assay results from swab and urine specimens was evaluated at seven geographically diverse clinical sites. A frequency distribution of the initial MaxRFU values for the GC Q^x assay is shown in Figure A. The distribution of MaxRFU values from GC Q^x true positive, true negative, false positive and false negative specimens (ie. from those specimens that yielded results which were discordant with the patient infected status [PIS]) is shown in Table 6A.

A total of 1,715 GC Q^x Assay results from BD SurePath™ specimens was evaluated from eleven geographically diverse clinical sites. A frequency distribution of the initial MaxRFU values for the GC Q^x assay is shown in Figure B. The distribution of MaxRFU values from GC Q^x true positive, true negative, false positive and false negative specimens (i.e., from those specimens that yielded results which were discordant with the patient infected status [PIS]) is shown in Table 6B.

A total of 2,074 GC Q^x Assay results from PreservCyt™ specimens was evaluated from eleven geographically diverse clinical sites. A frequency distribution of the initial MaxRFU values for the GC Q^x assay is shown in Figure C. The distribution of MaxRFU values from GC Q^x true positive, true negative, false positive and false negative specimens (i.e., from those specimens that yielded results which were discordant with the patient infected status [PIS]) is shown in Table 6C.

Figure A: Frequency Distribution of MaxRFU for the GC Q^x Assay (Swab and Urine Specimens)

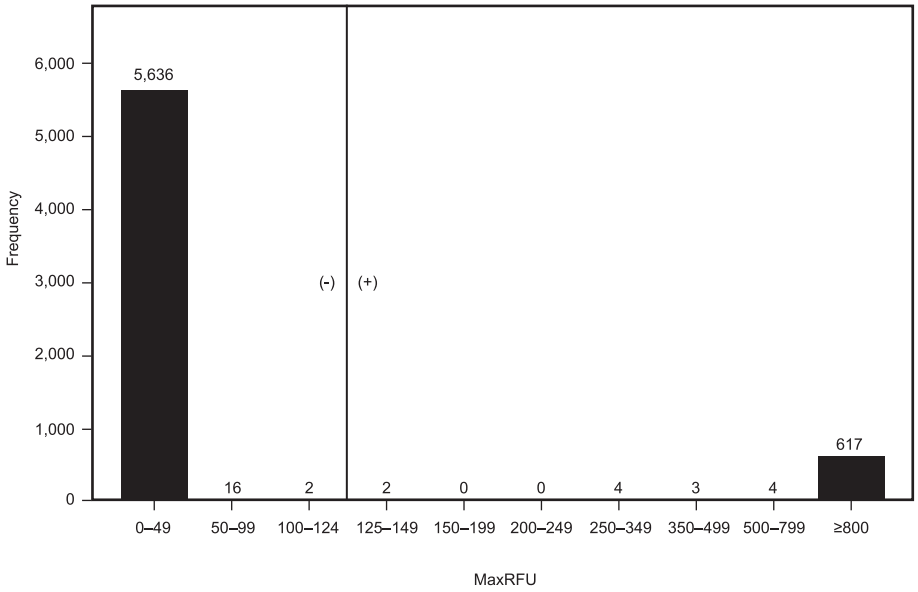


Figure B: Frequency Distribution of MaxRFU for the GC Q^x Assay (BD SurePath™ Specimens)

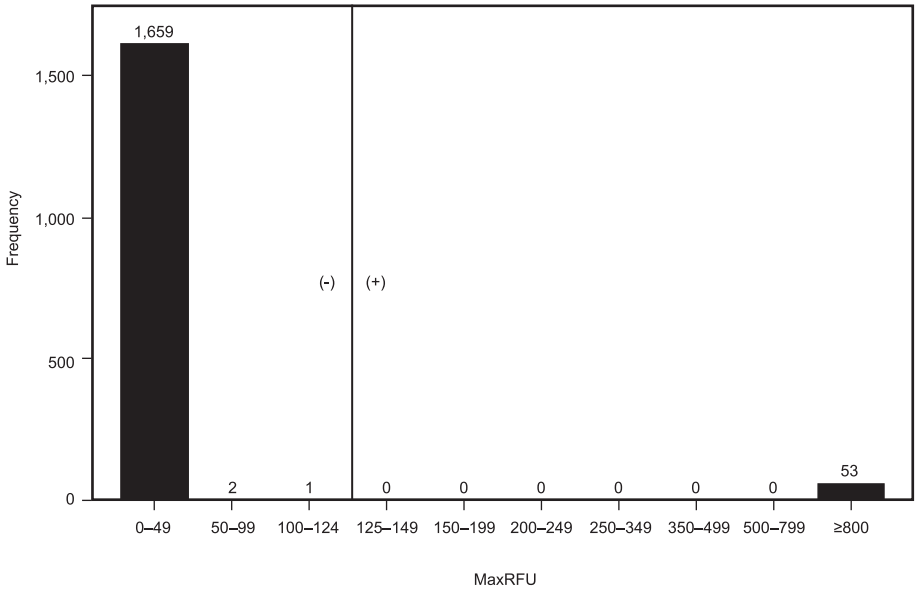


Figure C: Frequency Distribution of MaxRFU for the GC Q^x Assay (PreservCyt™ Specimens)

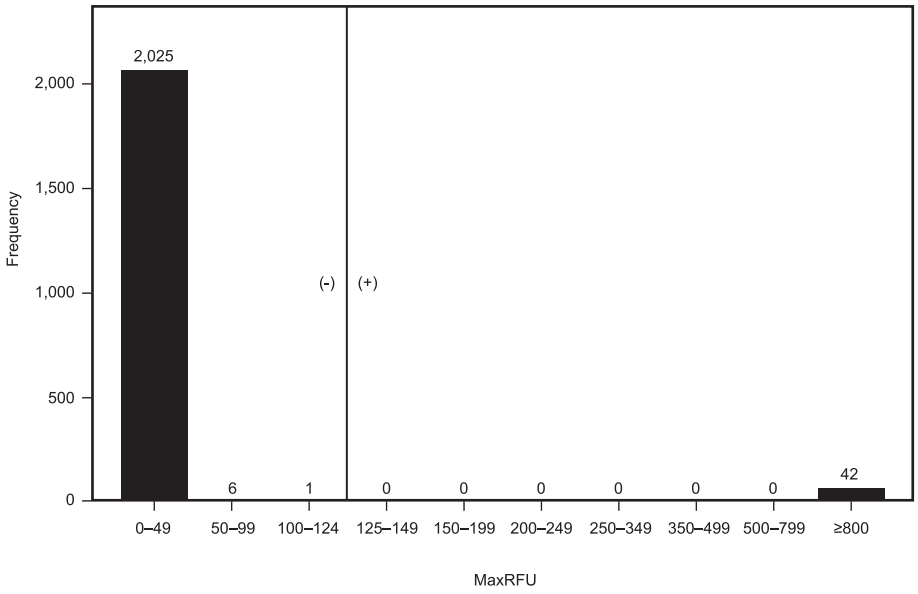


Table 6A: GC Q^x MaxRFU Ranges for False Negative, False Positive, True Negative and True Positive Results (Swab/Urine Specimens)

MaxRFU Range		0–49	50–99	100–124	125–149	150–199	200–249	250–349	350–499	500–799	≥ 800
Total		5,636	16	2	2	0	0	4	3	4	617
FN	FNU	2	0	0							
	FS	1	0	0							
	FUPT	1	0	0							
	Total	4	0	0							
FP	FNU				0	0	0	1	1	0	3
	FS				0	0	0	1	0	0	2
	FUPT				0	0	0	0	1	0	2
	FV				2	0	0	0	0	1	5
	MNU				0	0	0	1	0	1	5
	MS				0	0	0	0	0	0	6
	MUPT				0	0	0	0	1	0	5
	Total				2	0	0	3	3	2	28
TN	FNU	920	3	0							
	FS	918	5	1							
	FUPT	925	0	0							
	FV	913	6	1							
	MNU	655	0	0							
	MS	646	1	0							
	MUPT	655	1	0							
	Total	5,632	16	2							
TP	FNU				0	0	0	0	0	0	63
	FS				0	0	0	0	0	0	64
	FUPT				0	0	0	0	0	0	64
	FV				0	0	0	1	0	0	64
	MNU				0	0	0	0	0	0	112
	MS				0	0	0	0	0	2	110
	MUPT				0	0	0	0	0	0	112
	Total				0	0	0	1	0	2	589

Table 6B: GC Q^x MaxRFU Ranges for False Negative, False Positive, True Negative and True Positive Results (BD SurePath™ Specimens)

MaxRFU Range	0–49	50–99	100–124	125–149	150–199	200–249	250–349	350–499	500–799	≥ 800
FN	0	0	0							
FP				0	0	0	0	0	0	2
TN	1,659	2	1							
TP				0	0	0	0	0	0	51
Total	1,659	2	1	0	0	0	0	0	0	53

Table 6C: GC Q^x MaxRFU Ranges for False Negative, False Positive, True Negative and True Positive Results (PreservCyt™ Specimens)

MaxRFU Range	0–49	50–99	100–124	125–149	150–199	200–249	250–349	350–499	500–799	≥ 800
FN	2	0	0							
FP				0	0	0	0	0	0	1
TN	2,023	6	1							
TP				0	0	0	0	0	0	41
Total	2,025	6	1	0	0	0	0	0	0	42

D. Controls

During the swab/urine clinical evaluation, there were no GC Q^x Positive Control failures from 253 GC Q^x plate runs. For the GC Q^x Negative Control, a failure was observed in 1 of 253 GC Q^x plate runs. During the BD SurePath™ specimen clinical evaluation, there was one GC Q^x Positive Control failure and no GC Q^x Negative Control failures from 120 GC Q^x plates that were run. During the PreservCyt™ specimen clinical evaluation, there were no GC Q^x Positive Control failures and one GC Q^x Negative Control failure from 142 GC Q^x plates that were run. The CT/GC Q^x Positive and Negative Control MaxRFU values observed in the clinical trials are shown in Table 7.

Table 7: Distribution of MaxRFU Results for the GC Q^x Assay Negative and Positive Controls

Control	Statistic	Swab and Urine Specimen Clinical Study	BD SurePath™ Specimen Clinical Study	PreservCyt™ Specimen Clinical Study
GC Q^x Negative Control	n	252	120	141
MaxRFU	Maximum	17	42	10
	95th Percentile	7	0	0
	Median	0	0	0
	Mean	1	0	0
	5th Percentile	0	0	0
	Minimum	0	0	0
GC Q^x Positive Control	n	253	120	142
MaxRFU	Maximum	2,242	2,156	2,259
	95th Percentile	2,083	1,982	2,045
	Median	1,835	1,786	1,785
	Mean	1,814	1,777	1,789
	5th Percentile	1,502	1,478	1,555
	Minimum	530	1,370	886

PERFORMANCE CHARACTERISTICS

NOTE: The clinical performance characteristics presented below were generated on the BD Viper™ System in Extracted Mode.

Swab and Urine Specimen Clinical Study

Clinician-collected endocervical and male urethral swab specimens, patient-collected vaginal swab specimens (in a clinical setting), and male and female Q^x UPT and neat urine specimens were collected from 1,059 symptomatic and asymptomatic female subjects and 787 symptomatic and asymptomatic male subjects attending OB/GYN, sexually transmitted disease (STD) and family planning clinics at seven geographically diverse clinical sites in North America. Subjects were classified as symptomatic if they reported symptoms such as dysuria, urethral discharge, coital pain/difficulty/bleeding, testicular or scrotum pain/swelling, abnormal vaginal discharge, or pelvic/uterine/adnexal pain. Subjects were classified as asymptomatic if they did not report symptoms. Sixty five female subjects and 13 male subjects were excluded from the data analysis due to age requirement violations, antibiotic treatment in the last 21 days, opting to withdraw from the study after initially consenting, failure to obtain paired swab and urine specimens, urine quantity less than 20 mL, or transport and storage errors related to specimen collection. Therefore, the final data analysis included 994 compliant female subjects and 774 compliant male subjects.

Five specimens were collected from each of the 994 eligible female subjects. A urine specimen was collected and split into Q^x UPT, neat urine and the two reference urine specimen collection devices followed by a vaginal swab specimen and three randomized endocervical swab specimens. Up to four specimens were collected from each of the 774 eligible male subjects. Up to three randomized urethral swab specimens were collected followed by a urine specimen that was split into Q^x UPT, neat urine and the two reference urine specimen collection devices. BD ProbeTec™ GC Q^x assay results were generated from the Q^x UPT and neat urine specimens, the vaginal swab specimen, one endocervical swab specimen and one male urethral swab specimen. The remaining two endocervical swab specimens, up to two male urethral swab specimens, and the two reference urine specimens for each male and female subject were tested using two reference methods: the BD ProbeTec™ ET GC/AC assay and another commercially available NAAT (Nucleic Acid Amplification Test). Specimen testing was conducted either at the site of collection or at a designated BD Viper™ testing site.

All performance calculations were based on the total number of BD ProbeTec™ GC Q^x assays results for endocervical, vaginal and male urethral swab specimens, and male and female Q^x UPT and neat urine specimens compared to a patient infected status (PIS) algorithm for each gender. In the algorithm, the designation of a subject as being infected with GC or not was based on endocervical swab and urine specimen results from the commercially available BD ProbeTec™ ET GC/AC assay and the other commercially available NAAT. Subjects were considered infected with GC if two of the four endocervical swab and urine specimens (or two of the three or four urethral swab and urine specimens) tested positive in the BD ProbeTec™ ET GC/AC assay and the other reference NAAT (one specimen testing positive in each NAAT). Subjects were considered non-infected if less than two reference NAAT results were positive. A total of 6,284 BD ProbeTec™ GC Q^x assay results from symptomatic and asymptomatic male and female subjects were used to calculate sensitivity and specificity. Sensitivity and specificity by specimen type and symptomatic status are presented in Table 9A.

Performance of the assay with endocervical swabs, patient collected vaginal swab specimens (in a clinical setting), female UPT and neat urine was assessed in the clinical study. Separate performance was calculated for specimens collected from pregnant females. For the latter, sensitivity compared to patient infected status for FS, FV, FNU, and FUPT was 100% (3/3). In each case, specificity was 100% (24/24) for FS, FV, FNU, and FUPT separately.

Tables 11A and 11B summarize the number of results from symptomatic and asymptomatic subjects designated as infected or non-infected with GC according to the PIS algorithm.

NOTE: An explanation of symbols and abbreviations used in tables can be found in the Interpretation of Tables section (at end of insert).

BD SurePath™ Specimen Clinical Study

Endocervical swab specimens and BD SurePath™ specimens were collected from 1,728 compliant female subjects attending family planning, OB/GYN, and sexually transmitted disease clinics at eleven geographically diverse clinical sites in North America. Subjects were classified as symptomatic if they reported symptoms such as dysuria, coital pain/difficulty/bleeding, abnormal vaginal discharge, or pelvic/uterine/adnexal pain. Subjects were classified as asymptomatic if they did not report symptoms. Thirteen subjects did not have a BD SurePath™ specimen result. Therefore there were 1,715 subjects evaluated.

Three randomized endocervical swab specimens and a BD SurePath™ specimen were collected from each female subject. The three reference endocervical swabs were tested with the BD ProbeTec™ ET CT/GC/AC assay, the BD ProbeTec™ GC Q^x assay, and another commercially available NAAT (Nucleic Acid Amplification Test). Sensitivity and specificity for BD SurePath™ specimens were calculated by comparing results to a patient infected status (PIS) algorithm. The designation of positive or negative PIS was based on the endocervical swab specimen results from the three reference methods. At least two positive reference results were required to establish a subject as PIS-positive. At least two negative reference results were required to establish a subject as PIS-negative. The distribution of cervical sampling devices used in the clinical study according to clinical collection site is summarized in Table 8A. Sensitivity and specificity by symptomatic status are presented in Table 9B.

Table 11C summarizes the number of results from symptomatic and asymptomatic subjects designated as infected or non-infected with GC according to the PIS algorithm.

Table 12A summarizes the GC Q^x assay performance for BD SurePath™ specimens compared to PIS by clinic type.

Table 8A: Summary of Cervical Sampling Devices Used in the BD SurePath™ Specimen Clinical Study

Cervical Sampling Device Used	Clinical Collection Site Number											Total
	1	2	3	4	5	6	7	8	9	10	11	
Broom-Type Device	54	50	511	18	374	0	127	0	0	71	0	1,205
Spatula/Cytobrush	0	25	0	0	182	112	32	24	103	8	37	523

PreservCyt™ Specimen Clinical Study

Endocervical swab specimens and PreservCyt™ specimens were collected from 2,079 compliant female subjects attending family planning, OB/GYN, and sexually transmitted disease clinics at eleven geographically diverse clinical sites in North America. Subjects were classified as symptomatic if they reported symptoms such as dysuria, coital pain/difficulty/bleeding, abnormal vaginal discharge, or pelvic/uterine/adnexal pain. Subjects were classified as asymptomatic if they did not report symptoms. Two subjects were excluded due to an undetermined patient infected status. Three subjects did not have a PreservCyt™ specimen result. Therefore there were 2,074 subjects evaluated.

Three randomized endocervical swab specimens and a PreservCyt™ specimen were collected from each female subject. The three reference endocervical swabs were tested with the BD ProbeTec™ ET CT/GC/AC assay, the BD ProbeTec™ GC Q^x assay, and another commercially available NAAT (Nucleic Acid Amplification Test). Sensitivity and specificity for PreservCyt™ specimens were calculated by comparing results to a patient infected status (PIS) algorithm. The designation of positive or negative PIS was based on the endocervical swab specimen results from the three reference methods. At least two positive reference results were required to establish a subject as PIS-positive. At least two negative reference results were required to establish a subject as PIS-negative. The distribution of cervical sampling devices used in the clinical study according to clinical collection site is summarized in Table 8B. Sensitivity and specificity by symptomatic status are presented in Table 9C.

Table 11D summarizes the number of results from symptomatic and asymptomatic subjects designated as infected or non-infected with GC according to the PIS algorithm.

Table 12B summarizes the GC Q^x assay performance for PreservCyt™ specimens compared to PIS by clinic type.

Table 8B: Summary of Cervical Sampling Devices Used in the PreservCyt™ Specimen Clinical Study

Cervical Sampling Device Used	Clinical Collection Site Number											Total
	1	2	3	4	5	6	7	8	9	10	11	
Broom-Type Device	89	0	0	45	16	464	272	83	0	99	0	1,068
Spatula/Cytobrush	74	154	95	0	0	52	0	209	282	0	145	1,011

Table 9A: GC Q^x Assay Performance for Swab and Urine Specimens Compared to Patient Infected Status (by symptomatic status)

Specimen Type	Symptomatic Status	n	Sensitivity	95% C.I.	Specificity	95% C.I.	PPV	NPV	Error Initial/Final
FS	A	450	96.3% (26/27)	(81.0–99.9%)	99.5% (421/423)	(98.3–99.9%)	92.5%	99.8%	3/0
	S	542	100.0% (38/38)	(90.7–100.0%)	99.8% (503/504)	(98.9–100.0%)	97.4%	100.0%	2/2
	Total	992	98.5% (64/65)	(91.7–100.0%)	99.7% (924/927)	(99.1–99.9%)	95.9%	99.9%	5/2
FV[1]	A	449	100.0% (27/27)	(87.2–100.0%)	98.6% (416/422)	(96.9–99.5%)	82.0%	100.0%	0/0
	S	544	100.0% (38/38)	(90.7–100.0%)	99.6% (504/506)	(98.6–100.0%)	95.0%	100.0%	0/0
	Total	993	100.0% (65/65)	(94.5–100.0%)	99.1% (920/928)	(98.3–99.6%)	88.5%	100.0%	0/0
FNU[2]	A	450	96.3% (26/27)	(81.0–99.9%)	99.3% (420/423)	(97.9–99.9%)	89.8%	99.8%	0/0
	S	543	97.4% (37/38)	(86.2–99.9%)	99.6% (503/505)	(98.6–100.0%)	94.8%	99.8%	0/0
	Total	993	96.9% (63/65)	(89.3–99.6%)	99.5% (923/928)	(98.7–99.8%)	93.1%	99.8%	0/0
FUPT[3]	A	450	100.0% (27/27)	(87.2–100.0%)	99.5% (421/423)	(98.3–99.9%)	92.7%	100.0%	0/0
	S	543	97.4% (37/38)	(86.2–99.9%)	99.8% (504/505)	(98.9–100.0%)	97.3%	99.8%	0/0
	Total	993	98.5% (64/65)	(91.7–100.0%)	99.7% (925/928)	(99.1–99.9%)	95.8%	99.9%	0/0
MS[4]	A	508	100.0% (12/12)	(73.5–100.0%)	99.2% (492/496)	(97.9–99.8%)	75.5%	100.0%	0/0
	S	257	100.0% (100/100)	(96.4–100.0%)	98.7% (155/157)	(95.5–99.8%)	98.0%	100.0%	1/0
	Total	765	100.0% (112/112)	(96.8–100.0%)	99.1% (647/653)	(98.0–99.7%)	95.0%	100.0%	1/0
MNU[4]	A	517	100.0% (12/12)	(73.5–100.0%)	99.2% (501/505)	(98.0–99.8%)	74.6%	100.0%	0/0
	S	257	100.0% (100/100)	(96.4–100.0%)	98.1% (154/157)	(94.5–99.6%)	97.1%	100.0%	0/0
	Total	774	100.0% (112/112)	(96.8–100.0%)	98.9% (655/662)	(97.8–99.6%)	93.9%	100.0%	0/0
MUPT[4]	A	517	100.0% (12/12)	(73.5–100.0%)	99.2% (501/505)	(98.0–99.8%)	74.6%	100.0%	1/0
	S	257	100.0% (100/100)	(96.4–100.0%)	98.7% (155/157)	(95.5–99.8%)	98.0%	100.0%	0/0
	Total	774	100.0% (112/112)	(96.8–100.0%)	99.1% (656/662)	(98.0–99.7%)	95.0%	100.0%	1/0
Total		6,284	99.3% (592/596)	(98.3–99.8%)	99.3% (5,650/5,688)	(99.1–99.5%)	93.7%	99.9%	7/2[5]

[1] Of the 994 female subjects enrolled in the study, one subject did not provide vaginal swab specimens.
[2] Of the 994 female subjects enrolled in the study, one neat urine specimen was excluded for noncompliant urine specimen storage.
[3] Of the 994 female subjects enrolled in the study, one Q^x UPT urine specimen was excluded for noncompliant urine specimen storage.
[4] Clinical Trial enrollment for asymptomatic male subjects was extended to obtain the total number of clinical positives for this sub-population.
[5] Three liquid level errors, two extraction control failures, and one extraction transfer error were generated. Two of the three liquid level errors and the two extraction control failures resolved as negative and were included in the sensitivity and specificity calculations. The one liquid level error and one extraction transfer error failed to resolve and were not included in the sensitivity and specificity calculations.

Table 9B: GC Q^x Assay Performance for BD SurePath™ Specimens Compared to Patient Infected Status (by symptomatic status)

Symptomatic Status	n	Sensitivity	95% C.I.	Specificity	95% C.I.	PPV	NPV	Error Initial/Final
A	1,157	100.0% (32/32)	(89.1–100.0%)	99.8% (1,123/1,125)	(99.4–100.0%)	93.5%	100.0%	2/0
S	558	100.0% (19/19)	(82.4–100.0%)	100.0% (539/539)	(99.3–100.0%)	100.0%	100.0%	0/0
Total	1,715	100.0% (51/51)	(93.0–100.0%)	99.9% (1,662/1,664)	(99.6–100.0%)	96.90%	100.0%	2/0

Table 9C: GC Q^x Assay Performance for PreservCyt™ Specimens Compared to Patient Infected Status (by symptomatic status)

Symptomatic Status	n	Sensitivity	95% C.I.	Specificity	95% C.I.	PPV	NPV	Error Initial/Final
A	1,349	92.3% (24/26)	(74.9–99.1%)	100.0% (1,323/1,323)	(99.7–100.0%)	100.0%	99.9%	1/0
S	725	100.0% (17/17)	(80.5–100.0%)	99.9% (707/708)	(99.2–100.0%)	95.9%	100.0%	0/0
Total	2,074	95.3% (41/43)	(84.2–99.4%)	99.95% (2,030/2,031)	(99.7–100.0%)	100.0%	99.9%	1/0

Table 10A: GC Q^x Assay Performance for Swab and Urine Specimens Compared to Patient Infected Status (by clinical site)

Specimen Type	Collect Site	Prevalence	n	Sensitivity	95% C.I.	Specificity	95% C.I.	# CT (+) and GC (+)	PPV	NPV
FS[6]	1	8.4%	155	100.0% (13/13)	(75.3–100.0%)	99.3% (141/142)	(96.1–100.0%)	5	92.9%	100.0%
	2	10.4%	154	93.8% (15/16)	(69.8–99.8%)	99.3% (137/138)	(96.0–100.0%)	6	94.0%	99.3%
	3	6.8%	73	100.0% (5/5)	(47.8–100.0%)	98.5% (67/68)	(92.1–100.0%)	2	82.9%	100.0%
	4	19.0%	105	100.0% (20/20)	(83.2–100.0%)	100.0% (85/85)	(95.8–100.0%)	6	100.0%	100.0%
	5	1.4%	70	100.0% (1/1)	(2.5–100.0%)	100.0% (69/69)	(94.8–100.0%)	0	100.0%	100.0%
	6	2.2%	365	100.0% (8/8)	(63.1–100.0%)	100.0% (357/357)	(99.0–100.0%)	3	100.0%	100.0%
	7	2.9%	70	100.0% (2/2)	(15.8–100.0%)	100.0% (68/68)	(94.7–100.0%)	0	100.0%	100.0%
FV[7]	1	8.4%	155	100.0% (13/13)	(75.3–100.0%)	99.3% (141/142)	(96.1–100.0%)	5	92.9%	100.0%
	2	10.3%	155	100.0% (16/16)	(79.4–100.0%)	97.1% (135/139)	(92.8–99.2%)	6	79.8%	100.0%
	3	6.8%	73	100.0% (5/5)	(47.8–100.0%)	100.0% (68/68)	(94.7–100.0%)	2	100.0%	100.0%
	4	19.0%	105	100.0% (20/20)	(83.2–100.0%)	97.6% (83/85)	(91.8–99.7%)	6	90.7%	100.0%
	5	1.4%	70	100.0% (1/1)	(2.5–100.0%)	100.0% (69/69)	(94.8–100.0%)	0	100.0%	100.0%
	6	2.2%	365	100.0% (8/8)	(63.1–100.0%)	99.7% (356/357)	(98.4–100.0%)	3	88.2%	100.0%
	7	2.9%	70	100.0% (2/2)	(15.8–100.0%)	100.0% (68/68)	(94.7–100.0%)	0	100.0%	100.0%
FNU[8]	1	8.4%	155	100.0% (13/13)	(75.3–100.0%)	98.6% (140/142)	(95.0–99.8%)	5	86.8%	100.0%
	2	10.3%	155	93.8% (15/16)	(69.8–99.8%)	97.8% (136/139)	(93.8–99.6%)	6	83.0%	99.3%
	3	6.8%	73	100.0% (5/5)	(47.8–100.0%)	100.0% (68/68)	(94.7–100.0%)	2	100.0%	100.0%
	4	19.2%	104	100.0% (20/20)	(83.2–100.0%)	100.0% (84/84)	(95.7–100.0%)	6	100.0%	100.0%
	5	1.4%	70	100.0% (1/1)	(2.5–100.0%)	100.0% (69/69)	(94.8–100.0%)	0	100.0%	100.0%
	6	2.2%	366	100.0% (8/8)	(63.1–100.0%)	100.0% (358/358)	(99.0–100.0%)	3	100.0%	100.0%
	7	2.9%	70	50.0% (1/2)	(1.3–98.7%)	100.0% (68/68)	(94.7–100.0%)	0	100.0%	98.5%

Specimen Type	Collect Site	Prevalence	n	Sensitivity	95% C.I.	Specificity	95% C.I.	# CT (+) and GC (+)	PPV	NPV
FUPT[9]	1	8.4%	155	100.0% (13/13)	(75.3–100.0%)	99.3% (141/142)	(96.1–100.0%)	5	92.9%	100.0%
	2	10.3%	155	93.8% (15/16)	(69.8–99.8%)	99.3% (138/139)	(96.1–100.0%)	6	93.9%	99.3%
	3	6.8%	73	100.0% (5/5)	(47.8–100.0%)	100.0% (68/68)	(94.7–100.0%)	2	100.0%	100.0%
	4	19.2%	104	100.0% (20/20)	(83.2–100.0%)	98.8% (83/84)	(93.5–100.0%)	6	95.2%	100.0%
	5	1.4%	70	100.0% (1/1)	(2.5–100.0%)	100.0% (69/69)	(94.8–100.0%)	0	100.0%	100.0%
	6	2.2%	366	100.0% (8/8)	(63.1–100.0%)	100.0% (358/358)	(99.0–100.0%)	3	100.0%	100.0%
	7	2.9%	70	100.0% (2/2)	(15.8–100.0%)	100.0% (68/68)	(94.7–100.0%)	0	100.0%	100.0%
MS[10]	1	10.5%	313	100.0% (33/33)	(89.4–100.0%)	99.6% (279/280)	(98.0–100.0%)	11	96.7%	100.0%
	2	40.5%	79	100.0% (32/32)	(89.1–100.0%)	95.7% (45/47)	(85.5–99.5%)	10	94.1%	100.0%
	4	20.6%	170	100.0% (35/35)	(90.0–100.0%)	98.5% (133/135)	(94.8–99.8%)	11	94.5%	100.0%
	5	6.0%	182	100.0% (11/11)	(71.5–100.0%)	99.4% (170/171)	(96.8–100.0%)	5	91.4%	100.0%
	7	4.8%	21	100.0% (1/1)	(2.5–100.0%)	100.0% (20/20)	(83.2–100.0%)	0	100.0%	100.0%
MNU[11]	1	10.5%	313	100.0% (33/33)	(89.4–100.0%)	99.3% (278/280)	(94.7–99.9%)	11	94.4%	100.0%
	2	40.5%	79	100.0% (32/32)	(89.1–100.0%)	95.7% (45/47)	(85.5–99.2%)	10	94.1%	100.0%
	4	20.6%	170	100.0% (35/35)	(90.0–100.0%)	97.8% (132/135)	(93.6–99.5%)	11	92.2%	100.0%
	5	5.8%	191	100.0% (11/11)	(71.5–100.0%)	100.0% (180/180)	(98.0–100.0%)	5	100.0%	100.0%
	7	4.8%	21	100.0% (1/1)	(2.5–100.0%)	100.0% (20/20)	(83.2–100.0%)	0	100.0%	100.0%
MUPT[12]	1	10.5%	313	100.0% (33/33)	(89.4–100.0%)	98.9% (277/280)	(96.9–99.8%)	11	91.4%	100.0%
	2	40.5%	79	100.0% (32/32)	(89.1–100.0%)	97.9% (46/47)	(88.7–99.9%)	10	97.0%	100.0%
	4	20.6%	170	100.0% (35/35)	(90.0–100.0%)	99.3% (134/135)	(95.9–100.0%)	11	97.4%	100.0%
	5	5.8%	191	100.0% (11/11)	(71.5–100.0%)	99.4% (179/180)	(96.9–100.0%)	5	91.1%	100.0%
	7	4.8%	21	100.0% (1/1)	(2.5–100.0%)	100.0% (20/20)	(83.2–100.0%)	0	100.0%	100.0%

[6] 22 of the 65 FS PIS positive subjects were co-infected with CT.
[7] 22 of the 65 FV PIS positive subjects were co-infected with CT.
[8] 22 of the 65 FNU PIS positive subjects were co-infected with CT.
[9] 22 of the 65 FUPT PIS positive subjects were co-infected with CT.
[10] 37 of the 112 MS PIS positive subjects were co-infected with CT.
[11] 37 of the 112 MNU PIS positive subjects were co-infected with CT.
[12] 37 of the 112 MUPT PIS positive subjects were co-infected with CT.

Table 10B: GC Q^x Assay Performance for BD SurePath™ Specimens Compared to Patient Infected Status (by clinical site)

Collection Site	Prevalence	n	Sensitivity	95% C.I.	Specificity	95% C.I.	# CT (+) and GC (+)	PPV	NPV
1	10.8%	74	100.0% (8/8)	(63.1–100.0%)	100.0% (66/66)	(94.6–100.0%)	7	100.0%	100.0%
2	3.9%	103	100.0% (4/4)	(39.8–100.0%)	100.0% (99/99)	(96.3–100.0%)	1	100.0%	100.0%
3	0.0%	37	NA	NA	100.0% (37/37)	(90.5–100.0%)	0	NA	NA
4	25.9%	54	100.0% (14/14)	(76.8–100.0%)	97.5% (39/40)	(86.8–99.9%)	4	93.3%	100.0%
5	4.3%	69	100.0% (3/3)	(29.2–100.0%)	100.0% (66/66)	(94.6–100.0%)	1	100.0%	100.0%
6	1.6%	555	100.0% (9/9)	(66.4–100.0%)	99.8% (545/546)	(99.0–100.0%)	2	89.0%	100.0%
7	2.0%	511	100.0% (10/10)	(69.2–100.0%)	100.0% (501/501)	(99.3–100.0%)	5	100.0%	100.0%
8	1.3%	159	100.0% (2/2)	(15.8–100.0%)	100.0% (157/157)	(97.7–100.0%)	2	100.0%	100.0%
9	0.0%	112	NA	NA	100.0% (112/112)	(96.8–100.0%)	0	NA	NA
10	5.6%	18	100.0% 1/1)	(2.5–100.0%)	100.0% (17/17)	(80.5–100.0%)	0	100.0%	100.0%
11	0.0%	23	NA	NA	100.0% (23/23)	(85.2–100.0%)	0	NA	NA

Table 10C: GC Q^x Assay Performance for PreservCyt™ Specimens Compared to Patient Infected Status (by clinical site)

Collection Site	Prevalence	n	Sensitivity	95% C.I.	Specificity	95% C.I.	# CT (+) and GC (+)	PPV	NPV
1	5.5%	163	88.9% (8/9)	(51.8–99.7%)	100.0% (154/154)	(97.6–100.0%)	5	100.0%	99.4%
2	5.2%	154	100.0% (8/8)	(63.1–100.0%)	99.3% (145/146)	(96.2–100.0%)	1	88.7%	100.0%
3	3.2%	95	100.0% (3/3)	(29.2–100.0%)	100.0% (92/92)	(96.1–100.0%)	2	100.0%	100.0%
4	13.3%	45	100.0% (6/6)	(54.1–100.0%)	100.0% (39/39)	(91.0–100.0%)	2	100.0%	100.0%
5	0.0%	16	NA	NA	100.0% (16/16)	(79.4–100.0%)	0	NA	NA
6	1.6%	516	100.0% (8/8)	(63.1–100.0%)	100.0% (508/508)	(99.3–100.0%)	2	100.0%	100.0%
7	2.9%	272	87.5% (7/8)	(47.3–99.7%)	100.0% (264/264)	(98.6–100.%)	3	100.0%	99.6%
8	0.0%	292	NA	NA	100.0% (292/292)	(98.7–100.0%)	0	NA	NA
9	0.0%	282	NA	NA	100.0% (282/282)	(98.7–100.0%)	0	NA	NA
10	0.0%	97	NA	NA	100.0% (97/97)	(96.3–100.0%)	0	NA	NA
11	0.7%	142	100.0% (1/1)	(2.5–100.0%)	100.0% (141/141)	(97.4–100.0%)	0	100.0%	100.0%

Table 11A: Analysis of GC Positive/Negative Swab and Urine Specimens from Female Subjects Based on Patient Infected Status

	NAAT 1		NAAT 2		BD ProbeTec™ GC Q^x Amplified DNA Assay				Symptomatic Status		
PIS GC	Endocervical Swab	Urine	Endocervical Swab	Urine	Q^x Endocervical Swab	Q^x Vaginal Swab	Neat Urine	Q^x UPT Urine	A	S	Total
+	–	+	+	+	–	+	+	+	1	0	1
	+	–	+	–	+	+	–	–	0	1	1
	+	–	+	–	+	+	+	+	3	0	3
	+	–	+	+	+	+	+	+	1	1	2
	+	+	+	–	+	+	+	+	2	1	3
	+	+	+	+	+	+	–	+	1	0	1
	+	+	+	+	+	+	+	+	19	35	54
Total PIS Positive									**27**	**38**	**65**
–	NA	–	–	–	–	–	–	–	12	2	14
	–	NA	E	–	–	–	NA	NA	0	1	1
	–	NA	–	–	–	–	–	–	1	1	2
	–	I	–	–	–	–	–	–	5	1	6
	–	–	NA	–	–	–	–	–	1	2	3
	–	–	E	–	–	–	–	–	1	0	1
	–	–	–	–	ET	–	–	–	0	1	1
	–	–	–	–	LE	–	–	–	0	1	1
	–	–	–	–	–	NA	–	–	1	0	1
	–	–	–	–	–	–	–	–	390	484	874
	–	–	–	–	–	–	–	+	0	1	1
	–	–	–	–	–	–	+	–	1	1	2
	–	–	–	–	–	+	–	–	4	1	5
	–	–	–	–	–	+	+	–	0	1	1
	–	–	–	–	–	+	+	+	1	0	1
	–	–	–	–	+	–	–	–	0	1	1
	–	–	+	–	–	–	–	–	1	3	4
	–	–	+	–	+	–	–	–	1	0	1
	–	+	–	–	–	–	–	–	1	2	3
	+	–	–	–	–	–	–	–	2	3	5
	+	+	–	–	+	+	+	+	1	0	1
Total PIS Negative									**423**	**506**	**929**

I = Indeterminate

LE = Liquid Level Error

Table 11B: Analysis of GC Positive/Negative Specimens from Male Subjects Based on Patient Infected Status

	NAAT 1		NAAT 2		BD ProbeTec™ GC Q^x Amplified DNA Assay			Symptomatic Status		
PIS GC	Urethral Swab	Urine	Urethral Swab	Urine	Q^x Urethral Swab	Neat Urine	Q^x UPT Urine	A	S	Total
+	+	+	+	+	+	+	+	11	81	92
	+	+	NA	+	+	+	+	1	13	14
	NA	+	+	+	+	+	+	0	6	6
Total PIS Positive								**12**	**100**	**112**
–	–	I	–	–	–	–	–	4	1	5
	–	I	NA	–	–	–	–	1	0	1
	–	–	E	–	–	–	–	2	0	2
	–	–	–	E	–	–	–	0	1	1
	–	–	–	–	NA	–	–	9	0	9
	–	–	–	–	–	–	–	422	124	546
	–	–	–	–	–	–	+	2	1	3
	–	–	–	–	–	+	–	1	1	2
	–	–	–	–	–	+	+	1	0	1
	–	–	–	–	+	–	–	3	0	3
	–	–	–	+	–	–	–	2	1	3
	–	–	+	–	–	–	–	2	1	3
	–	–	+	+	+	+	–	0	1	1
	–	–	NA	–	–	–	–	29	11	40
	–	+	–	–	–	–	–	1	0	1
	–	NA	–	–	–	–	–	1	0	1
	+	–	–	–	–	–	–	0	1	1
	+	+	NA	–	–	–	–	0	1	1
	NA	–	–	–	–	–	–	22	11	33
	NA	–	–	–	–	+	–	1	0	1
	NA	–	+	–	–	–	–	1	0	1
	NA	–	+	+	+	+	+	1	1	2
	NA	+	–	–	–	–	–	0	1	1
Total PIS Negative								**505**	**157**	**662**

Table 11C: Analysis of GC Positive/Negative BD SurePath™ Specimens Based on Patient Infected Status

	NAAT 1	NAAT 2	NAAT 3	BD ProbeTec™ GC Q^x Amplified DNA Assay	Symptomatic Status		
PIS GC	Swab	Swab	Swab	BD SurePath™	A	S	Total
+	–	+	+	+	0	1	1
	+	–	+	+	1	1	2
	+	+	+	+	31	17	48
Total PIS Positive					**32**	**19**	**51**
–	–	–	+	+	1	0	1
	–	+	–	+	1	0	1
	–	I	–	–	2	2	4
	–	–	NA	–	6	1	7
	–	–	–	–	1,103	531	1,634
	–	–	+	–	6	1	7
	–	+	–	–	5	3	8
	+	–	–	–	1	1	2
Total PIS Negative					**1,125**	**539**	**1,664**

Table 11D: Analysis of GC Positive/Negative PreservCyt™ Specimens Based on Patient Infected Status

	NAAT 1	NAAT 2	NAAT 3	BD ProbeTec™ GC Q^x Amplified DNA Assay	Symptomatic Status		
PIS GC	**Swab**	**Swab**	**Swab**	**PreservCyt™**	**A**	**S**	**Total**
+	NA	+	+	+	1	3	4
	+	–	+	–	1	0	1
	+	–	+	+	1	0	1
	+	+	NA	+	1	0	1
	+	+	+	–	1	0	1
	+	+	+	+	21	14	35
Total PIS Positive					**26**	**17**	**43**
–	NA	–	–	–	181	79	260
	–	I	–	–	1	0	1
	–	–	NA	–	3	0	3
	–	–	LE	–	2	0	2
	–	–	–	–	1,129	624	1,753
	–	–	–	+	0	1	1
	–	–	+	–	2	0	2
	–	+	–	–	4	3	7
	+	–	–	–	1	1	2
Total PIS Negative					**1,323**	**708**	**2,031**

Table 12A: GC Q^x Assay Performance for BD SurePath™ Specimens Compared to Patient Infected Status (by clinic type)

Clinic Type	Prevalence	n	Sensitivity	95% C.I.	Specificity	95% C.I.	PPV	NPV
Family Planning	1.4%	844	100.0% (12/12)	(73.5–100.0%)	99.9% (831/832)	(99.3–100.0%)	93.4%	100.0%
OB/GYN	1.8%	548	100.0% (10/10)	(69.2–100.0%)	100.0% (538/538)	(99.3–100.0%)	100.0%	100.0%
STD	9.0%	323	100.0% (29/29)	(88.1–100.0%)	99.7% (293/294)	(98.1–100.0%)	97.1%	100.0%

Table 12B: GC Q^x Assay Performance for PreservCyt™ Specimens Compared to Patient Infected Status (by clinic type)

Clinic Type	Prevalence	n	Sensitivity	95% C.I.	Specificity	95% C.I.	PPV	NPV
Family Planning	0.7%	1,187	100.0% (8/8)	(63.1–100.0%)	100.0% (1,179/1,179)	(99.7–100.0%)	100.0%	100.0%
OB/GYN	3.0%	367	90.9% (10/11)	(58.7–99.8%)	100.0% (356/356)	(99.0–100.0%)	100.0%	99.7%
STD	4.6%	520	95.8% (23/24)	(78.9–99.9%)	99.8% (495/496)	(98.9–100.0%)	95.9%	99.8%

GC Q^x Assay Analytical Sensitivity

The Limits of Detection (LODs) for the GC Q^x Assay with *Neisseria gonorrhoeae* strain ATCC 19424 in urine and swab specimens when extracted on the BD Viper™ System were determined to be < 50 cells per mL for neat and Q^x UPT urine and < 100 GC cells per mL for expressed vaginal, endocervical swab, BD SurePath™ and PreservCyt™ specimens.

The GC Q^x Assay on the BD Viper™ System in extracted mode was able to detect 17 GC strains (ATCC 19424, 27628, 27629, 27630, 27632, 27633, 27631, 21823, 51803, 23051, 31407, 31953, 35201, 31397, 31151, 43785, 51804) with ≥ 95% proportion positive at a concentration of 50 cells per mL in Q^x Swab Diluent, in BD SurePath™ Preservative Fluid in LBC Specimen Dilution Tubes, and in PreservCyt™ Solution in LBC Specimen Dilution Tubes.

GC Q^x Assay Analytical Specificity

DNA from 141 organisms listed in Table 13 was extracted on the BD Viper™ System and tested with the BD ProbeTec™ GC Q^x Amplified DNA Assay. All potential cross-reactive species were tested at > $1x10^8$ cells/mL except where noted. Two *N. cinerea* and two *N. lactamica* strains were shown to cross-react in the GC Q^x assay.

Table 13: Potential Cross-reacting Microorganisms

Acinetobacter calcoaceticus	*Enterococcus faecium*	*Peptostreptococcus asaccharolyticus*	*Neisseria elongata* subsp. *glycolytica*
Acinetobacter lwoffi	Epstein Barr Virus***	*Peptostreptococcus productus*	*Neisseria elongata* subsp. *nitroreduscens* (2)
Actinomyces israelii	*Escherichia coli*	*Plesiomonas shigelloides*	*Neisseria elongata*
Adenovirus***	*Flavobacterium meningosepticum*	*Propionibacterium acnes*	*Neisseria flava* (4)
Aeromonas hydrophilia	*Gardnerella vaginalis*	*Providencia stuartii*	*Neisseria flavescens* (4)
*Alcaligenes faecalis**	*Gemella haemolysans*	*Pseudomonas aeruginosa*	*Neisseria lactamica* (7)
*Bacillus subtilis**	*Haemophilus influenzae*	*Salmonella minnesota*	*Neisseria meningitidis* (12)
Bacteroides fragilis	Herpes Simplex Virus **	*Salmonella typhimurium*	*Neisseria mucosa* (5)
*Candida albicans**	Human papillomavirus (16 and 18)***	*Staphylococcus aureus*	*Neisseria perflava* (8)
*Candida glabrata**	*Kingella kingae*	*Staphylococcus epidermidis*	*Neisseria polysaccharea* (2)
*Candida tropicalis**	*Klebsiella pneumoniae*	*Streptococcus agalactiae*	*Neisseria sicca* (5)
Chlamydia trachomatis	*Lactobacillus acidophilus**	*Streptococcus mitis*	*Neisseria subflava* (15)
Chlamydia pneumoniae	*Lactobacillus brevis*	*Streptococcus mutans*	*Neisseria weaverii* (3)
*Chlamydia psittaci**	*Lactobacillus jensenii**	*Streptococcus pneumoniae**	
Citrobacter freundii	*Listeria monocytogenes*	*Streptococcus pyogenes*	
Clostridium perfringens	*Mobiluncus mulieris*	*Streptomyces griseus***	
Corynebacterium renale	*Moraxella lacunata**	*Trichomonas vaginalis***	
*Cryptococcus neoformans**	*Moraxella osloensis*	*Veillonella parvula*	
Cytomegalovirus**	*Morganella morganii*	*Vibrio parahaemolyticus*	
Edwardsiella tarda	*Mycobacterium gordonae*	*Yersinia enterocolitica*	
Enterobacter cloacae	*Mycobacterium smegmatis*	*Branhamella catarrhalis* (5)	
Enterococcus faecalis	*Peptostreptococcus anaerobius*	*Neisseria cinerea* (2)	

(n) number of strains tested in the **BD ProbeTec™** GC Q^x Assay

* Tested at > 1x10^7 cells or EB/mL; **Tested at > 1x10^6 cells or viral particles per mL; ***Tested at ≥ 1x10^6 genomic equivalents per mL

GC Q^x Interfering Substances

The performance of the BD ProbeTec™ GC Q^x Assay on the BD Viper™ System in extracted mode was evaluated in the presence of potential interfering substances which may be encountered in swab, urine,BD SurePath™ and/or PreservCyt™ specimens. Potential interfering substances were spiked into Q^x UPT urine, vaginal swab specimen matrices, BD SurePath™ specimens in LBC Specimen Dilution Tubes, and PreservCyt™ specimens in LBC Specimen Dilution Tubes in both the presence and the absence of GC organisms (150 GC cells/mL in urine matrix and 300 GC cells/mL in Swab/LBC Specimen Dilution Tube matrix). Results are summarized in Table 14.

Table 14: GC Q^x Interfering Substances

Interpretation	Swab	Urine	BD SurePath™	PreservCyt™
No interference observed	Blood (≤ 60%) Seminal fluid Mucus Over the counter vaginal products and contraceptives Hemorrhoidal cream Prescription vaginal treatments Leukocytes (1x10^6 cells/mL) 1x10^6 EB/mL *Chlamydia trachomatis*	Blood (≤1%) Seminal fluid Mucus Antibiotics Analgesics Phenazopyridine Over the counter deodorant sprays and powders Hormones Leukocytes Albumin <1 mg/mL Glucose Acidic urine (pH 4.0) Alkaline urine (pH 9.0) Bilirubin 1x10^6 EB/mL *Chlamydia trachomatis* Organisms associated with urinary tract infections	Blood (≤ 1%) Seminal fluid Mucus Over the counter vaginal products and contraceptives Hemorrhoidal cream Prescription vaginal treatments Leukocytes (1x10^6 cells/mL) 1x10^6 EB/mL *Chlamydia trachomatis*	Blood (≤ 1%) Seminal fluid Mucus Over the counter vaginal products and contraceptives Hemorrhoidal cream Prescription vaginal treatments Leukocytes (1x10^6 cells/mL) 1x10^6 EB/mL *Chlamydia trachomatis*
May cause extraction control (EC) failures	Blood (> 60%)	Not applicable	Not applicable	Glacial Acetic Acid + Blood (≤ 5%/1% V/V)
May cause false negative results	Not applicable	Not applicable	Not applicable	Glacial Acetic Acid + Blood (≤ 5%/1% V/V)

Neat and Q^x UPT Urine Stability

Pools of GC negative male and female urine specimens were used in analytical experiments to support the urine storage and transport stability claims. For neat urine, pools were co-spiked with CT serovar H and GC strain ATCC 19424 at 45 EB per mL and 150 cells per mL, respectively. Neat urine specimens were stored at either 2–8 °C for 1, 3 or 7 days; or at 30 °C for 8, 24 or 30 hours; or at -20 °C for 180 days. At each time point, samples were removed from storage and tested with the BD ProbeTec™ GC Q^x Assay on the BD Viper™ System in extracted mode. Thirty-two assay replicates were generated for each condition (sample type/temperature/duration). The expected results were obtained with the GC Q^x assay under all conditions tested.

For Q^x UPT urine, pooled specimens were co-spiked with CT serovar H and GC strain ATCC 19424 at 45 EB per mL and 150 cells per mL, respectively. The spiked urine specimen pools were then stored at either 2–8°C for 24 hours or 30 °C for 8 hours prior to transfer into Q^x UPT tubes. The Q^x UPT specimens were then stored either at 2–8 °C for 14, 21, or 30 days; or at 30 °C for 14, 21, or 30 days; or at -20 °C for 180 days. At each time point Q^x UPT specimens were removed from storage and tested with the BD ProbeTec™ GC Q^x Assay on the BD Viper™ System in extracted mode. Thirty-two assay replicates were generated for each condition (sample type/temperature/duration). The expected results were obtained with the GC Q^x assay under all conditions tested.

Vaginal Dry and Expressed Swab Stability

Pools of GC negative vaginal swab matrix were used in analytical experiments to support the storage and transport stability claims for dry vaginal swab specimens. Pools were co-spiked with CT serovar H and GC strain ATCC 19424 to achieve 90 EB per mL and 300 cells per mL, respectively, when seeded onto swabs and expressed in Q^x Swab Diluent. Seeded dry swabs were stored at 2–8 °C for 3, 7, or 14 days; or at 30 °C for 3, 7, or 14 days; or at -20 °C for 30, 60, or 180 days. At each time point, dry swabs were removed from storage and expressed into 2 mL of Q^x Swab Diluent and evaluated with the BD ProbeTec™ GC Q^x Assay on the BD Viper™ System in extracted mode. Thirty-two assay replicates were generated for each condition (sample type/temperature/duration). The expected results were obtained with the GC Q^x assay under all conditions tested.

Pools of GC negative vaginal swab matrix were used in analytical experiments to support the storage and transport stability claims for expressed vaginal swab specimens. Pools were spiked with CT serovar H and GC strain ATCC 19424 to achieve 90 EB per mL and 300 cells per mL, respectively. The spiked swab matrix was stored at 2–8 °C for 7, 14, or 30 days; or at 30 °C for 7, 14, or 30 days; or at -20 °C for 30, 60, or 180 days. At each time point, samples were removed from storage and tested with the BD ProbeTec™ GC Q^x Assay on the BD Viper™ System in extracted mode. Thirty-two assay replicates were generated for each condition (sample type/temperature/duration). The expected results were obtained with the GC Q^x assay under all conditions tested.

Endocervical and Urethral Swab Specimen Stability

Pools of GC negative endocervical swab matrix were used in analytical experiments to support the storage and transport stability claims for endocervical and urethral swab specimens. Pools of swab matrix were spiked with CT serovar H and GC strain ATCC 19424 at 90 EB per mL and 300 cells per mL, respectively. The pools were dispensed in 2 mL volumes into BD sample tubes to simulate “wet” endocervical specimens and stored at either 2–8 °C for 7, 14, or 30 days; or at 30 °C for 7, 14, or 30 days; or at -20 °C for 30, 60, or 180 days. At each time point, samples were removed from storage and tested with the BD ProbeTec™ GC Q^x Assay on the BD Viper™ System in extracted mode. Thirty-two assay replicates were generated for each condition (sample type/temperature/duration). The expected results were obtained with the GC Q^x assay under all conditions tested.

Post Pre-warm Specimen Stability

Pools of male and female GC negative neat urine specimens were used in analytical experiments to support the storage stability claims for pre-warmed neat and Q^x UPT urine specimens. Pooled specimens were spiked with CT serovar H and GC strain ATCC 19424 at 45 EB per mL and 150 cells per mL, respectively and either added to Q^x UPT tubes or left untreated as neat urine. Both specimen types were pre-warmed at 114 °C for 15 min, and cooled for 15 min. After the pre-warm process, specimen tubes were stored at either 2–8 °C for 1, 3 or 7 days; or at 30 °C for 1, 3 or 7 days; or at -20 °C for 30 or 180 days. At each time point samples were removed from storage and tested with the BD ProbeTec™ GC Q^x Assay on the BD Viper™ System in extracted mode. Thirty-two assay replicates were generated for each condition (sample type/temperature/duration). The expected results were obtained with the GC Q^x assay under all conditions tested.

Pools of GC negative vaginal and endocervical swab specimen matrices in Q^x Swab Diluent were used in analytical experiments to support the storage stability claims for pre-warmed expressed vaginal, endocervical, and male urethral swab specimens. For both types of matrix, pooled specimens were spiked with CT serovar H and GC strain ATCC 19424 at 90 EB per mL and 300 cells per mL, respectively and aliquotted into 2 mL volumes in BD specimen tubes. The tubes were pre-warmed at 114 °C for 15 min and cooled for 15 min. After the pre-warm process, the specimen tubes were stored either at 2–8 °C for 3 or 7 days; or at 30 °C for 3 or 7 days; or at -20 °C for 30 or 180 days. At each time point, samples were removed from storage and tested with the BD ProbeTec™ GC Q^x Assay on the BD Viper™ System in extracted mode. Thirty-two assay replicates were generated for each condition (sample type/temperature/duration). The expected results were obtained with the GC Q^x assay under all conditions tested.

BD SurePath™ Specimen Stability

Pools of CT and GC negative BD SurePath™ clinical specimens were used in analytical experiments to support the storage and stability claims. Pools were co-spiked with CT serovar H and GC strain ATCC 19424 to achieve 90 EB per mL and 300 cells per mL, respectively. The pools were dispensed in 10 mL volumes in BD SurePath™ vials and stored at either 2–8 °C or 30 °C. After 30 days, 0.5 mL from each vial was removed and added to an LBC Specimen Dilution Tube. The specimens in the LBC Specimen Dilution Tube were then stored at 2–8 °C for 30 days; or at 30 °C for 30 days; or at -20 °C for 90 days. At each time point, samples were removed from storage and tested with the BD ProbeTec™ GC Q^x Assay on the BD Viper™ System in extracted mode. Twenty-four assay replicates were generated for each condition (temperature/duration). The expected results were obtained with the GC Q^x assay under all conditions tested.

PreservCyt™ Specimen Stability

Pools of CT and GC negative PreservCyt™ clinical specimens were used in analytical experiments to support the storage and stability claims. Pools were co-spiked with CT serovar H and GC strain ATCC 19424 to achieve 90 EB per mL and 300 cells per mL, respectively. The pools were dispensed in 20 mL volumes in PreservCyt™ vials and stored at either 2–8 °C or 30 °C. After 30 days, 0.5 mL from each vial was removed and added to an LBC Specimen Dilution Tube. The specimens in the LBC Specimen Dilution Tube were then stored at 2–8 °C for 30 days; or at 30 °C for 30 days; or at -20 °C for 90 days. At each time point, samples were removed from storage and tested with the BD ProbeTec™ GC Q^x Assay on the BD Viper™ System in extracted mode. Twenty-four assay replicates were generated for each condition (temperature/duration). The expected results were obtained with the GC Q^x assay under all conditions tested.

Reproducibility

Reproducibility of the BD Viper™ System using the BD ProbeTec™ GC Q^x Assay was evaluated at three clinical sites on one BD Viper™ System per site. A panel of simulated specimens was tested that comprised CT and GC organisms seeded into swab diluent for the BD ProbeTec™ GC Q^x Assay. Simulated endocervical and urethral specimens contained a clean endocervical swab whereas the simulated urine and vaginal swab specimens did not. Uninoculated swab diluent for the BD ProbeTec™ GC Q^x Assay was used for the GC negative samples. Nine replicates of each panel member were tested every day for five days on each BD Viper™ System. The data are summarized in Table 15A.

Table 15A: Summary of Reproducibility Data for Swab and Urine Specimens on the BD Viper™ System for the GC Q^x Assay

						Within Run		Between Runs Within Site		Between Site	
Specimen Type	CT EBs/mL	GC Cells/mL	% Correct	95% CI	MaxRFU Mean	SD	%CV	SD	%CV	SD	%CV
Endocervical/ Urethral	0	0	99.3% (134/135)	(95.9–100.0%)	13.8	151.3	1,096.3	0.0	0.0	0.6	4.3
	30	0	98.5% (133/135)	(94.8–99.8%)	28.1	220.7	785.3	0.0	0.0	33.8	120.3
	0	100	100.0% (135/135)	(97.3–100.0%)	1,859.5	94.1	5.1	0.0	0.0	19.2	1.0
	30	250	100.0% (135/135)	(97.3–100.0%)	1,847.3	117.6	6.4	0.0	0.0	25.9	1.4
	75	100	100.0% (135/135)	(97.3–100.0%)	1,855.9	119.4	6.4	0.0	0.0	42.2	2.3
Urine/Vaginal	0	0	99.3% (134/135)	(95.9–100.0%)	15.7	162.3	1,031.1	0.0	0.0	0.0	0.0
	30	0	100.0% (135/135)	(97.3–100.0%)	1.1	3.1	295.8	0.7	69.7	0.5	48.3
	0	100	100.0% (135/135)	(97.3–100.0%)	1,899.0	86.1	4.5	22.8	1.2	0.0	0.0
	30	250	100.0% (135/135)	(97.3–100.0%)	1,884.2	94.0	5.0	13.8	0.7	0.0	0.0
	75	100	100.0% (135/135)	(97.3–100.0%)	1,867.2	87.7	4.7	0.0	0.0	19.2	1.0

A second study was conducted internally to characterize the reproducibility of test results (i.e., proportion positive or negative) at target levels below the analytical Limit of Detection (LOD) of the BD ProbeTec™ GC Q^x Assay. A panel of simulated specimens was tested that comprised GC and CT organisms seeded into Q^x swab diluent at two different levels (1:10, 1:100) each of which was below the analytical LOD for the respective organism. These levels were selected to fall within the dynamic range of the analytical LOD curve of the assay. Fifteen replicates of each panel member were tested every day for five days across three BD Viper™ Systems. The data are summarized in Table 15B.

Table 15B: Characterization of System Reproducibility at Target Levels below the Analytical Limit of Detection for the GC Q^x Assay for Swab and Urine Specimens

Specimen	Dilution of Analytical LOD	% Positive	95% CI (Positive)	MaxRFU Mean (Positive)	% Negative	95% CI (Negative)	MaxRFU Mean (Negative)
Endocervical/ Urethral	**1:10**	92.9% (209/225)	(88.7–95.9%)	1,324.6	7.1% (16/225)	(4.1–11.3%)	41.4
Endocervical/ Urethral	**1:100**	30.7% (69/225)	(24.7–37.1%)	835.9	69.3% (156/225)	(62.9–75.3%)	7.2
Urine/Vaginal	**1:10**	90.7% (204/225)	(86.1–94.1%)	1,165.9	9.3% (21/225)	(5.9–13.9%)	34.2
Urine/Vaginal	**1:100**	22.7% (51/225)	(17.4–28.7%)	872.7	77.3% (174/225)	(71.3–82.6%)	7.8

A reproducibility study of the BD Viper™ System using the BD ProbeTec™ GC Q^x Assay was also conducted for Liquid Based Cytology (LBC) specimens at three clinical sites on one BD Viper™ System per site. A panel of simulated specimens comprising CT and GC organisms seeded into LBC Specimen Dilution Tubes containing LBC medium was tested with the BD ProbeTec™ GC Q^x Assay. Uninoculated LBC Specimen Dilution Tubes containing LBC medium were used for the GC negative samples. Nine replicates of each panel member were tested every day for five days on each BD Viper™ System. The data are summarized in Table 15C. Two additional levels were included in the panels to characterize the reproducibility of test results (i.e., proportion positive or negative) at target levels below the analytical Limit of Detection (LOD) of the BD ProbeTec™ GC Q^x Assay. These additional specimens comprised CT and GC organisms seeded into LBC Specimen Dilution Tubes containing LBC medium at dilutions of 1:10 and 1:100 of the respective analytical LODs of each analyte. These levels were selected to fall within the dynamic range of the analytical LOD curves for the BD ProbeTec™ CT Q^x and GC Q^x assays. Nine replicates of each panel member were tested every day for five days across the three BD Viper™ Systems. The data are summarized in Table 15D.

Table 15C: Summary of Reproducibility Data for LBC Specimens on the BD Viper™ System for the GC Q^x Assay

					Within Run		Between Runs Within Site		Between Site	
CT EBs/mL	GC Cells/mL	% Correct	95% CI	Mean MaxRFU	SD	%CV	SD	%CV	SD	%CV
0	0	100.0% (135/135)	(97.3–100.0%)	1.21	4.00	330.38	0.00	0.00	0.00	0.00
30	0	100.0% (135/135)	(97.3–100.0%)	0.98	7.47	761.30	0.00	0.00	0.17	17.04
0	100	100.0% (135/135)	(97.3–100.0%)	1,982.77	83.92	4.23	0.00	0.00	0.00	0.00
30	250	100.0% (135/135)	(97.3–100.0%)	1,983.66	87.76	4.42	0.00	0.00	24.80	1.25
75	100	100.0% (135/135)	(97.3–100.0%)	1,920.14	81.94	4.27	59.45	3.10	0.00	0.00

Table 15D: Characterization of System Reproducibility at Target Levels Below the Analytical Limit of Detection for the GC Q^x Assay for LBC Specimens

Dilution of Analytical LOD	% Positive	95% CI (Positive)	MaxRFU Mean (Positive)	% Negative	95% CI (Negative)	MaxRFU Mean (Negative)
1:10	74.1% (100/135)	(65.8–81.2%)	1,159.2	25.9% (35/135)	(18.8–34.2%)	21.2
1:100	8.9% (12/135)	(4.7–15.0%)	1,136.5	91.1% (123/135)	(85.0–95.3%)	6.6

System Cross Contamination and Carryover

An internal study was conducted to evaluate the risk of producing a false positive result in either the same run on the BD Viper™ System in extracted mode (within run cross-contamination) or in a subsequent run (between run carryover). Testing was conducted using negative and positive samples on three BD Viper™ Systems. Negative samples consisted of Q^x Swab Diluent/LBC Specimen Dilution Tube with PreservCyt™ Solution. Positive samples consisted of a representative analyte (10^5 CT EB/mL) spiked into Q^x Swab Diluent/LBC Specimen Dilution Tube with PreservCyt™ Solution. The overall rate of cross-contamination (i.e., with alternating columns of positive and negative samples and a prevalence of 50%) was 0.41% (9/2,208) for the Q^x Swab Diluent and 0.45% (5/1,104) for the LBC Specimen Dilution Tube with PreservCyt™ Solution. The overall rate of carryover contamination (i.e., carryover between successive runs when the prevalence was 50% in the previous run) was 0.36% (8/2,208) for the Q^x Swab diluent and 0.54% (6/1,104) for the LBC Specimen Dilution Tube with PreservCyt™ Solution. Cross-contamination and carryover rates across the three BD Viper™ Systems are summarized in Tables 16A and 16B.

Table 16A: Cross Contamination and Carryover Contamination (Swab/Urine)

		Cross-Contamination			Carryover Contamination		
Assay Dispense Mode Selected	BD Viper™ System	n	Positive Results	Percent Positive	n	Positive Results	Percent Positive
Dual Assay	1	736	5	0.68%	736	1	0.14%
	2	736	0	0.00%	736	3	0.41%
	3	736	4	0.54%	736	4	0.54%
	Overall	2,208	9	0.41%	2,208	8	0.36%
Single Assay	1	190	0	0.00%	186	0	0.00%
	2	188	1	0.53%	186	1	0.54%
	3	188	0	0.00%	186	0	0.00%
	Overall	566	1	0.18%	558	1	0.18%

Table 16B: Cross Contamination and Carryover Contamination (LBC Medium)

		Cross-Contamination			Carryover Contamination		
Medium Type	BD Viper™ System	n	Positive Results	Percent Positive	n	Positive Results	Percent Positive
PreservCyt™	1	368	1	0.27%	368	1	0.27%
	2	368	3	0.82%	368	0	0.00%
	3	368	1	0.27%	368	5	0.45%
	Overall	1,104	5	0.45%	1,104	6	0.54%

BD VIPER™ LT SYSTEM

PRINCIPLES OF THE PROCEDURE:

The BD ProbeTec™ GC Q^x Amplified DNA Assay Gray Amp Reagent Pack is designed for use with the BD ProbeTec™ *Chlamydia trachomatis/Neisseria gonorrhoeae* (CT/GC) Q^x specimen collection and transport devices, applicable reagents, the BD Viper™ Systems and BD FOX™ Extraction. Specimens are collected and transported in their respective transport devices which preserve the integrity of *N. gonorrhoeae* DNA over the specified ranges of temperature and time.

All specimens undergo a pre-warm step in the BD Pre-warm Heater to dissolve mucus and homogenize the specimen. After cooling, the specimens are loaded onto the BD Viper™ LT System which then performs all of the steps involved in extraction and amplification of target DNA, without further user intervention. For gynecological specimens that are collected and transported in BD SurePath™ Preservative Fluid or PreservCyt™ Solution, an aliquot is simply transferred to a Liquid-Based Cytology Specimen (LBC) Dilution Tube for the BD ProbeTec™ Q^x Amplified DNA Assays prior to prewarming the specimen. The specimen is transferred to an Extraction Tube that contains ferric oxide particles in a dissolvable film and dried Extraction Control. A high pH is used to lyse the bacterial cells and liberate their DNA into solution. Acid is then added to lower the pH and induce a positive charge on the ferric oxide, which in turn binds the negatively charged DNA. The particles and bound DNA are then pulled to the sides of the Extraction Tube by magnets and the treated specimen is aspirated to waste. The particles are washed and a high pH Elution Buffer is added to recover the purified DNA. Finally, a Neutralization Buffer is used to bring the pH of the extracted solution to the optimum for amplification of the target.

The BD ProbeTec™ GC Q^x Amplified DNA Assay is based on the simultaneous amplification and detection of target DNA using amplification primers and a fluorescently-labeled detector probe.[8,9] The reagents for SDA are dried in two separate disposable microwells: the Priming Microwell contains the amplification primers, fluorescently-labeled detector probe, nucleotides and other reagents necessary for amplification, while the Gray Amplification Microwell contains the two enzymes (a DNA polymerase and a restriction endonuclease) that are required for SDA. The BD Viper™ LT System pipettes a portion of the purified DNA solution from each Extraction Tube into a Priming Microwell to rehydrate the contents. After a brief incubation, the reaction mixture is transferred to a corresponding, pre-warmed Gray Amplification Microwell which is sealed to prevent contamination and then incubated in a thermally controlled fluorescent reader. The presence or absence of *N. gonorrhoeae* DNA is determined by calculating the peak fluorescence (Maximum Relative Fluorescent Units [MaxRFU]) over the course of the amplification process and by comparing this measurement to a predetermined threshold value.

In addition to the fluorescent probe used to detect amplified *N. gonorrhoeae* target DNA, a second fluorescently labeled oligonucleotide is incorporated in each reaction. The Extraction Control (EC) oligonucleotide is labeled with a different dye than that used for detection of the *N. gonorrhoeae*-specific target and is used to confirm the validity of the extraction process. The EC is dried in the Extraction Tubes and is re-hydrated upon addition of the specimen and extraction reagents. At the end of the extraction process, the EC fluorescence is monitored by the BD Viper™ LT instrument and an automated algorithm is applied to both the EC and *N. gonorrhoeae*-specific signals to report specimen results as positive, negative, or EC failure.

MATERIALS PROVIDED

Each BD ProbeTec™ GC Q^x Assay Gray Amp Reagent Pack contains:

- GC Q^x Amplified DNA Assay Priming Microwells, 4 x 96: each Priming Microwell contains approximately 30 pmol oligonucleotides, 45 pmol fluorescently-labeled detector probe, 100 nmol dNTPs, with stabilizers and buffer components.
- GC Q^x Amplified DNA Assay Gray Amplification Microwells, 4 x 96: each Gray Amplification Microwell contains approximately 14 units DNA polymerase and 50 units restriction enzyme, with stabilizers and buffer components.

NOTE: Each microwell pouch contains one desiccant bag.

MATERIALS REQUIRED BUT NOT PROVIDED

Control Set for the BD ProbeTec™ CT/GC Q^x Amplified DNA Assays: 24 CT/GC Q^x Positive Control Tubes containing approximately 2,400 copies each of pCTB4 and pGCint3 linearized plasmids in carrier nucleic acid, and 24 CT/GC Q^x Negative Control Tubes containing carrier nucleic acid alone. The concentrations of the pCTB4 and pGCint3 plasmids are determined by UV spectrophotometry.

Swab Diluent for the BD ProbeTec™ Q^x Amplified DNA Assays (Q^x Swab Diluent): 48 tubes each containing approximately 2 mL of potassium phosphate/potassium hydroxide buffer with DMSO and preservative.

Liquid Based Cytology Specimen (LBC) Dilution Tubes for the BD ProbeTec™ Q^x Amplified DNA Assays (LBC Specimen Dilution Tube): 400 tubes each containing approximately 1.7 mL of Tris/Sodium Chloride solution and preservative.

BD FOX™ Extraction Tubes: 48 strips of 8 tubes, each containing approximately 10 mg of iron oxide in a dissolvable film and approximately 240 pmol fluorescently-labeled Extraction Control oligonucleotide.

BD Viper™ SDA Extraction Reagent Trough with Piercing Tool: 5-cavity Extraction Reagent trough contains approximately 11.5 mL Lysis Reagent, 16.5 mL Binding Acid, 72.5 mL Wash Buffer, 25.4 mL Elution Buffer, and 19.4 mL Neutralization Buffer with preservative.

INSTRUMENT, EQUIPMENT AND SUPPLIES REQUIRED

Materials Available from BD

BD Viper™ LT Instrument, BD Viper™ Instrument Plates, BD Viper™ LT Amplification Plate Carriers, BD Viper™ LT Pipette Tips, BD Viper™ LT Solid Waste Liners, BD Viper™ LT Waste Bottle, BD Pre-warm Heater, BD Viper™ LT Specimen Rack, BD Viper™ LT Extraction Rack, BD Viper™ Neutralization Pouches, Specimen Tubes and Caps for use on the BD Viper™ System (Extracted Mode), Urine Preservative Transport for the BD ProbeTec™ Q^x Amplified DNA Assays (Q^x UPT), BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens, Male Urethral Specimen Collection Kit for the BD ProbeTec™ Q^x Amplified DNA Assays, Vaginal Specimen Transport for the BD ProbeTec™ Q^x Amplified DNA Assays, BD Viper™ LT System SDA Accessory Kit.

Materials Required But Not Available from BD

Nitrile gloves, 3% (w/v) hydrogen peroxide*,1% (v/v) sodium hypochlorite**, DNA *AWAY*™, *Neisseria gonorrhoeae* ATCC 19424 (diluted in phosphate buffered saline) or Bio-Rad AmpliTrol™ CT/GC, displacement pipettes, polypropylene aerosol-resistant pipette tips capable of delivering 0.5 ± 0.05 mL, molecular biology-grade nuclease-free water, and a vortex mixer.

*Do not use hydrogen peroxide from a bottle that has remained open for longer than 8 days.

**Prepare fresh daily.

STORAGE AND HANDLING REQUIREMENTS

Reagents may be stored at 2–33 °C. Unopened Reagent Packs are stable until the expiration date. Once a pouch is opened, the microwells are stable for 6 weeks if properly sealed or until the expiration date, whichever comes first. Do not freeze.

WARNINGS AND PRECAUTIONS

General

1. For in vitro diagnostic use. For Use by Trained Laboratory Personnel.
2. Pathogenic microorganisms, including hepatitis viruses and Human Immunodeficiency Virus, may be present in clinical specimens. "Standard Precautions"[10-13] and institutional guidelines should be followed in handling all items contaminated with blood and other body fluids.
3. For additional specific **warnings**, cautions and notes specific to the BD Viper™ LT, consult the BD Viper™ LT System User's Manual.

Dispose of all used reagents and any other contaminated disposable materials following procedures for infectious or potentially infectious waste. It is the responsibility of each laboratory to handle solid and liquid waste according to their nature and degree of hazardousness and to treat and dispose of them (or have them treated and disposed of) in accordance with any applicable regulations.

Specimen:

4. For collection of endocervical swab specimens, use only the BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens.
5. For patient-collection and transport of vaginal swabs, use only the Vaginal Specimen Transport for the BD ProbeTec™ Q^x Amplified DNA Assays.
6. For collection of male urethral swab specimens, use only the Male Urethral Specimen Collection Kit for the BD ProbeTec™ Q^x Amplified DNA Assays.
7. For urine specimens, use only the Q^x UPT or unpreserved (neat) urine.
8. Under or over dispensing of urine into Specimen Tubes or the Q^x UPT may affect assay performance. Over filling the tube may also result in liquid overflow on the BD Viper™ LT deck, and could cause contamination.
9. For male urethral and female endocervical swab specimens, specimens must be collected and tested before the expiration date of the Q^x Swab Diluent tube.
10. For vaginal specimens, specimens must be collected and processed before the expiration date of the Vaginal Specimen Transport. Once expressed, specimens must be tested before the expiration date of the Q^x Swab Diluent tube.
11. For urine specimens, specimens must be tested before the expiration date of the Q^x UPT.
12. For liquid-based cytology specimens, use only the Liquid Based Cytology Specimen (LBC) Dilution Tube for the BD ProbeTec™ Q^x Amplified DNA Assays.
13. Liquid-based cytology solutions contain flammable substances.
14. For testing with the BD ProbeTec™ CT/GC Q^x Amplified DNA Assay on the BD Viper™ LT System, be sure to obtain aliquots of specimens collected in BD SurePath™ Preservative Fluid or PreservCyt™ Solution prior to processing for either the BD SurePath™ or ThinPrep™ Pap test. Failure to do so may result in erroneous results.
15. The BD ProbeTec™ CT/GC Q^x Amplified DNA Assay may not be used with BD SurePath™ or PreservCyt™ residual specimens.
16. Do not run PreservCyt™ specimens that have been treated with glacial acetic acid on the BD Viper™ LT System. Extraction Control failures or False Negative results may occur.
17. Use only polypropylene aerosol-resistant pipette tips to transfer specimens to the LBC Specimen Dilution Tube.
18. Liquid-based cytology specimens must be tested before the expiration date of the LBC Specimen Dilution Tube.
19. Specimens should not be pre-warmed more than two times.

Assay/Reagent:

20. This reagent pack is for testing endocervical and patient-collected vaginal swabs (in a clinical setting), male urethral swabs, male and female urine specimens, and BD SurePath™ and PreservCyt™ specimens with the BD Viper™ LT System.
21. The Q^x UPT contains **NAP Guard** (approximately 742.5 mM K_2EDTA).
22. Use only sample and control tubes with pierceable caps on the BD Viper™ LT System. Do not remove pierceable caps prior to running the instrument. Be sure to replace any punctured pierceable caps with new pierceable caps prior to running the instrument.
23. Do not interchange or mix kit reagents from kits with different lot numbers.
24. The Q^x Swab Diluent for the BD ProbeTec™ Q^x Amplified DNA Assays contains dimethyl sulfoxide (DMSO). DMSO is harmful by inhalation, in contact with skin and if swallowed. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.

WARNING

H302+H312+H332 Harmful if swallowed, in contact with skin or if inhaled.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray. **P280** Wear protective gloves/protective clothing/eye protection/face protection. **P264** Wash thoroughly after handling. **P270** Do not eat, drink or smoke when using this product. **P271** Use only outdoors or in a well-ventilated area. **P321** Specific treatment (see on this label). **P301+P312** IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. **P304+P340** IF INHALED: Remove person to fresh air and keep comfortable for breathing. **P330** Rinse Mouth. **P302+P352** IF ON SKIN: Wash with plenty of soap and water. **P362+P364** Take off contaminated clothing and wash it before reuse. **P501** Dispose of contents/container in accordance with local/regional/national/international regulations.

25. Do not test the Q^x Swab Diluent tube from the Endocervical/Lesion or the Male Urethral Specimen Collection Kits if received in the laboratory without the swab present. A false negative test result may occur.
26. Use only the BD Viper™ LT pipette tips as supplied by BD with the BD Viper™ LT System.
27. Use only Gray Amp Microwells as supplied in the BD ProbeTec™ GC Q^x Assay Gray Amp Reagent Pack with the BD Viper™ LT System.
28. Use only the BD Viper™ SDA Extraction Reagent Trough with Piercing Tool with the BD ProbeTec™ *Neisseria gonorrhoeae* (GC) Q^x Amplified DNA Assay Gray Amp Reagent Pack on the BD Viper™ LT System.
29. The BD Viper™ SDA Extraction Reagent Trough and Piercing Tool contains corrosive substances. These solutions have a strong caustic effect, and may cause severe burns to skin and mucous membranes.

DANGER

H302 Harmful if swallowed. **H314** Causes severe skin burns and eye damage. **H317** May cause an allergic skin reaction. **H350** May cause cancer. **H411** Toxic to aquatic life with long lasting effects.

P201 Obtain special instructions before use. **P202** Do not handle until all safety precautions have been read and understood. **P260** Do not breathe dust/fume/gas/mist/vapors/spray. **P261** Avoid breathing dust/fume/gas/mist/vapors/spray. **P264** Wash thoroughly after handling. **P270** Do not eat, drink or smoke when using this product. **P272** Contaminated work clothing should not be allowed out of the workplace. **P273** Avoid release to the environment. **P280** Wear protective gloves/protective clothing/eye protection/face protection. **P281** Use personal protective equipment as required. **P301+P312** IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. **P301+P330+P331** IF SWALLOWED: rinse mouth. Do NOT induce vomiting. **P303+P361+P353** IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. **P304+P340** IF INHALED: Remove person to fresh air and keep comfortable for breathing. **P305+P351+P338** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. **P302+P352** IF ON SKIN: Wash with plenty of soap and water. **P310** Immediately call a POISON CENTER or doctor/physician. **P321** Specific treatment (see on this label). **P333+P313** If skin irritation or rash occurs: Get medical advice/attention. **P363** Wash contaminated clothing before reuse. **P391** Collect spillage. **P405** Store locked up. **P501** Dispose of contents/container in accordance with local/regional/national/international regulations.

EUH210: Safety data sheet available on request.

30. Use only the Clear Plate Seals from the BD Viper™ LT System SDA Accessory Kit on the Gray Amp plates with the BD Viper™ LT System. Using other seals for sealing the Gray Amp plates may cause erroneous results.
31. Reagent pouches containing unused Priming Microwells and Amplification Microwells MUST be carefully resealed after opening. Verify that desiccant is present prior to resealing the reagent pouches.
32. Because the CT/GC Q^x Positive Control is used for both CT Q^x and GC Q^x testing, correct positioning of the microwell strips is important for final results reporting.
33. The plate containing the Gray Amp Microwells MUST be properly sealed with the BD Viper™ LT Clear Plate Sealer prior to moving the plate from the BD Viper™ LT System. Sealing ensures a closed reaction for amplification and detection and is necessary to avoid contamination of the instrument and work area with amplification products. Do not remove sealing material from microwells at any time.
34. Priming Microwells with residual fluid (after transfer of liquid from the Priming Microwells to the Gray Amp Microwells) represent a source of target contamination. Carefully seal Priming Microwells with BD Viper™ Black Plate Sealers prior to disposal.
35. To prevent contamination of the work environment with amplification products, use the disposal bags provided in the BD Viper™ LT System SDA Accessory Kit to dispose of tested Amplification Microwells. Make sure the bags are properly closed before disposal.
36. Although dedicated work areas are not required because the BD Viper™ LT design reduces the possibility of amplicon contamination in the testing environment, other precautions for controlling contamination, particularly to avoid contamination of specimens during manipulation, are necessary.
37. CHANGE GLOVES if they come in contact with specimen or appear to be wet, to avoid contaminating other specimens. Change gloves before leaving work area and upon entry into work area.

38. In the event of contamination of the work area or equipment with specimens or controls, thoroughly clean the contaminated area with 3% (w/v) hydrogen peroxide (do not use hydrogen peroxide from a bottle that has remained open for longer than 8 days), 1% (v/v) sodium hypochlorite, or DNA *AWAY*™ and rinse thoroughly with water. Allow surface to dry completely before proceeding.
39. In case of a spill on the BD Viper™ LT Specimen Rack, immerse the rack in 1% (v/v) sodium hypochlorite for 1–2 min. Do not exceed 2 min. Thoroughly rinse the rack with water and allow to air dry.
40. Clean the entire work area including counter tops with 1% (v/v) sodium hypochlorite on a daily basis. Thoroughly rinse with water. Allow surfaces to dry completely before proceeding with additional testing. Clean instrument surfaces with 3% hydrogen peroxide only – sodium hypochlorite can damage the electronics located under the deck of the BD Viper™ LT instrument.
41. Contact BD Technical Service and Support in the event of an unusual situation, such as a spill into the BD Viper™ LT instrument or DNA contamination that cannot be removed by cleaning.
42. Acid and Base spill kits should be on hand in the event of a spill of extraction reagents.

SWAB SPECIMEN COLLECTION, STORAGE AND TRANSPORT

For swab specimens, performance data in this package insert have been established with the BD ProbeTec™ Q^x collection kits listed. Performance with collection devices other than those listed has not been evaluated.

- BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens
- Vaginal Specimen Transport for the BD ProbeTec™ Q^x Amplified DNA Assays
- Male Urethral Specimen Collection Kit for the BD ProbeTec™ Q^x Amplified DNA Assays

Swab Specimen Collection

Endocervical Swab Specimen Collection using BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimen.

1. Remove the cleaning swab from packaging.
2. Using the polyester fiber-tipped cleaning swab with the white shaft, remove excess blood and mucus from the cervical os.
3. Discard the used cleaning swab.
4. Remove the pink collection swab from packaging.
5. Insert the collection swab into the cervical canal and rotate for 15–30 seconds.
6. Withdraw the swab carefully. Avoid contact with the vaginal mucosa.
7. Uncap the Q^x Swab Diluent tube.
8. Fully insert the collection swab into the Q^x Swab Diluent tube.
9. Break the shaft of the swab at the score mark. Use care to avoid splashing of contents.
10. **Tightly** recap the tube.
11. Label the tube with patient information and date/time collected.
12. Transport to laboratory.

Vaginal Swab Patient Collection Procedure using Vaginal Specimen Transport for the BD ProbeTec™ Q^x Amplified DNA Assays.

NOTE: Ensure that patients read the Patient Collection Instructions before providing them with a collection kit.

1. Wash hands with soap and water. Rinse and dry.
2. It is important to maintain a comfortable balance during the collection procedure.
3. Twist the cap to break the seal. Pull the cap with attached swab from the tube. Do not touch the soft tip or lay the swab down. If you touch or drop the swab tip or the swab is laid down, discard the swab and request a new vaginal swab.
4. Hold the swab by the cap with one hand so that the swab tip is pointing toward you.
5. With your other hand, gently spread the skin outside the vagina. Insert the tip of the swab into the vaginal opening. Point the tip toward your lower back and relax your muscles.
6. Gently slide the swab no more than 2 inches into the vagina. If the swab does not slide easily, gently rotate the swab as you push. **If it is still difficult, do not attempt to continue.** Make sure the swab touches the walls of the vagina so that moisture is absorbed by the swab.
7. Rotate the swab for 10–15 seconds.
8. Withdraw the swab without touching the skin. Place the swab in the tube and cap securely.
9. After collection, wash hands with soap and water, rinse, and dry.
10. Return the tube with the swab to the nurse or clinician as instructed.
11. Label with patient information and date/time collected.
12. Transport to laboratory.

Male Urethral Swab Specimen Collection using Male Urethral Specimen Collection Kit for the BD ProbeTec™ Q^x Amplified DNA Assays

1. Remove the swab from packaging.
2. Insert the swab 2–4 centimeter into the urethra and rotate for 3–5 seconds.
3. Withdraw the swab.
4. Uncap the Q^x Swab Diluent tube.
5. Fully insert the collection swab into the Q^x Swab Diluent tube.
6. Break the shaft of the swab at the score mark. Use care to avoid splashing of contents.

7. **Tightly** recap the tube.
8. Label the tube with patient information and date/time collected.
9. Transport to laboratory.

Swab Storage and Transport

Table 17 provides instructions for storage and transport conditions to the laboratory and/or test site for swab specimens. The endocervical and the male urethral swab specimens must be stored and transported to the laboratory and/or test site within 30 days after collection if kept at 2–30 °C or within 180 days after collection if kept frozen at -20 °C. Patient-collected vaginal swab specimens must be stored and transported to the laboratory and/or test site within 14 days after collection if kept at 2–30 °C or within 180 days after collection if kept frozen at -20 °C. Patient collected vaginal swab specimens that are expressed in Q^x Swab Diluent may be stored and processed within 30 days after expression if kept at 2–30 °C or within 180 days after the date of expression if kept frozen at -20 °C.

Table 17. Swab Specimen Storage and Transport

Swab Specimen Type To Be Processed	Female Endocervical Swab Specimen / Male Urethral Swab Specimen		Vaginal Swab Specimen			
			Dry Vaginal Swab Specimen (Collection Site)		Expressed Vaginal Swab Specimen (Test Site)	
Temperature Condition for Transport to Test Site and Storage	2–30 °C	-20 °C	2–30 °C	-20 °C	2–30 °C	-20 °C
Process Specimen According to Instructions	Within 30 days of collection	Within 180 days of collection	Express and process within 14 days of collection	Express and process within 180 days of collection	Within 30 days of expression	Within 180 days of expression

For U.S. and international shipments, specimens should be labeled in compliance with applicable state, federal, and international regulations covering the transport of clinical specimens and etiologic agents/infectious substances. Time and temperature conditions for storage must be maintained during transport.

URINE SPECIMEN COLLECTION, STORAGE AND TRANSPORT

For urine specimens, performance has been established with the Q^x UPT and with urine collected in a sterile, plastic, preservative-free, specimen collection cup (i.e., neat urine without preservatives). Performance with other collection methods and collection devices has not been established.

Urine Specimen Collection

1. The patient should not have urinated for at least 1 hour prior to specimen collection.
2. Collect the specimen in a sterile, preservative-free specimen collection cup.
3. The patient should collect the first 20–60 mL of voided urine (the first part of the stream – NOT midstream) into a urine collection cup.
4. Cap and label with patient identification and date/time collected.

Urine Transfer to Q^x UPT

NOTE: Urine specimens should be transferred from the collection cup to the Q^x UPT within 8 hours of collection if the urine specimen has been stored at 2–30 °C. Urine specimens stored at 2–8 °C can be held up to 24 hours prior to transfer to the Q^x UPT.

Wear clean gloves when handling the Q^x UPT tube and urine specimen. If gloves come in contact with the specimen, immediately change them to prevent contamination of other specimens.

1. Open the Q^x UPT Collection and Transport Kit and remove the Q^x UPT and transfer pipette from their packaging.
2. Label the Q^x UPT with the patient identification and date/time collected.
3. Hold the Q^x UPT upright and firmly tap the bottom of the tube on a flat surface to dislodge any large drops from inside the cap. Repeat if necessary.
4. Uncap the Q^x UPT and use the transfer pipette to dispense urine into the tube. The correct volume of urine has been added when the fluid level is between the purple lines on the fill window located on the Q^x UPT label. This volume corresponds to approximately 2.0–3.0 mL of urine. DO NOT overfill or under fill the tube.
5. Discard the transfer pipette in a biohazard waste container.

   NOTE: The transfer pipette is intended for use with a single specimen.
6. Tighten the cap securely on the Q^x UPT.
7. Invert the Q^x UPT 3–4 times to ensure that the specimen and reagent are well mixed.

Q^x UPT Urine Storage and Transport

Store and transport Q^x UPT urine specimens at 2–30 °C and pre-warm them within 30 days of transfer to the Q^x UPT.

Specimens may be stored in the Q^x UPT at -20 °C for up to 180 days prior to pre-warming.

Neat Urine Storage and Transport

Store and transport neat urine specimens from the collection site to the test site at 2–8 °C and pre-warm them within 7 days of collection. Neat urine stored at 2–30 °C must be pre-warmed within 30 h of collection. Neat urine specimens may also be stored frozen at -20 °C for up to 180 days prior to pre-warming.

Table 18. Urine Specimen Storage and Transport

Urine Specimen Type to be Processed	Q^x UPT			NEAT		
Urine Handling Options Prior To Transfer To Q^x UPT	Store urine specimen at 2–30 °C and transfer to Q^x UPT within 8 hours of collection or Store urine specimen at 2–8 °C and transfer to Q^x UPT within 24 hours of collection or Transfer to Q^x UPT immediately					
Temperature Condition for Storage and Transport to Test Site	2–8 °C	2–30 °C	-20 °C	2–8 °C	2–30 °C	-20 °C
Process and Test Specimen According to Instructions	Within 30 days after transfer to Q^x UPT		Within 180 days after transfer to Q^x UPT	Within 7 days of collection	Within 30 hours of collection	Within 180 days of collection

LBC SPECIMEN COLLECTION, STORAGE AND TRANSPORT

BD SurePath™ or PreservCyt™ specimens must be collected using either an endocervical broom or a brush/spatula combination as described in the BD SurePath™ or PreservCyt™ product insert. Once collected,
BD SurePath™ or PreservCyt™ specimens can be stored and transported in their original vials for up to 30 days at 2–30 °C prior to transfer to LBC Specimen Dilution Tubes.

Specimen Transfer to LBC Specimen Dilution Tube

A 0.5 mL aliquot of either the BD SurePath™ or PreservCyt™ specimen must be transferred from the original vial to the LBC Specimen Dilution Tube prior to processing for either the BD SurePath™ or ThinPrep™ Pap test. Wear gloves when handling the LBC Specimen Dilution Tube and the BD SurePath™ or PreservCyt™ specimen vial. If gloves come in contact with the specimen, immediately change them to prevent contamination of other specimens.

BD SurePath™ Specimen Transfer

NOTE: Refer to the BD PrepStain™ Slide Processor Product Insert for instructions on removing an aliquot from the BD SurePath™ specimen vial prior to performing the BD SurePath™ liquid-based Pap test.

1. Label an LBC Specimen Dilution Tube with patient identification information.
2. Remove the cap from the LBC Specimen Dilution Tube.
3. Transfer 0.5 mL from the specimen vial to the LBC Specimen Dilution Tube. Avoid pipetting fluid from the bottom of the vial. Discard pipette tip.

   NOTE: A separate pipette tip must be used for each specimen.
4. Tighten the cap on the LBC Specimen Dilution Tube securely.
5. Invert the LBC Specimen Dilution Tube 3–4 times to ensure that the specimen and diluent are well mixed.

PreservCyt™ Specimen Transfer

NOTE: Refer to the ThinPrep™ 2000/3000 System Operator's Manual Addendum for instructions on removing an aliquot from the PreservCyt™ specimen vial prior to performing the ThinPrep™ Pap test.

1. Label an LBC Specimen Dilution Tube with patient identification information.
2. Remove the cap from the LBC Specimen Dilution Tube.
3. Transfer 0.5 mL from the specimen vial to the LBC Specimen Dilution Tube. Avoid pipetting fluid from the bottom of the vial. Discard pipette tip.

   NOTE: A separate pipette tip must be used for each specimen.
4. Tighten the cap on the LBC Specimen Dilution Tube securely.
5. Invert the LBC Specimen Dilution Tube 3–4 times to ensure that the specimen and diluent are well mixed.

Storage and Transport of Specimens Transferred to the LBC Specimen Dilution Tubes

After transfer to an LBC Specimen Dilution Tube, the diluted specimen can be stored at 2–30 °C for up to 30 days. Diluted specimens may also be stored at -20 °C for up to 90 days.

SWAB SPECIMEN PROCESSING

Note: The optional Lighted Login Rack assists in correct specimen tube placement during specimen login. The rack is connected to the BD Viper™ LT instrument. Before starting specimen login, the Specimen Rack is placed on the Lighted Login Rack. As a specimen is logged, the assigned location on the rack lights to indicate where to place the tube. This continues until all specimens are logged in.

Processing procedure for the BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens or the Male Urethral Specimen Collection Kit for the BD ProbeTec™ Q^x Amplified DNA Assays

NOTE: If specimens are refrigerated or frozen, make sure they are brought to room temperature and mixed by inversion prior to proceeding.

1. Using the tube layout report, scan the Q^x Swab Diluent tube with **black pierceable cap and place** in order in the BD Viper™ LT Specimen Rack. If using the Lighted Login Rack, **place specimen tube in the position that is lit on the Lighted Login Rack.**

2. Repeat step 1 for additional swab specimens.
3. Specimens are ready to be pre-warmed.
4. **Change gloves** before proceeding to avoid contamination.

Processing procedure for the Vaginal Specimen Transport for the BD ProbeTec™ Q^x Amplified DNA Assays

NOTE: Wear clean gloves when handling the vaginal swab specimen. If gloves come in contact with specimen, immediately change them to prevent contamination of other specimens.

NOTE: If specimens are refrigerated or frozen, make sure they are brought to room temperature prior to expression.

1. Label a pre-filled BD ProbeTec™ Q^x Swab Diluent tube for each swab specimen to be processed.
2. Remove the cap and insert the swab specimen into the Q^x Swab Diluent. Mix by swirling the swab in the Q^x Swab Diluent for 5–10 seconds.
3. Express the swab along the inside of the tube so that liquid runs back into the bottom of the tube.
4. Remove the swab carefully from the Q^x Swab Diluent tube to avoid splashing.
5. Place the expressed swab back into the transport tube and discard with biohazardous waste.
6. Tightly recap the Q^x Swab Diluent tube with the **black pierceable cap**.
7. Repeat steps 1–6 for additional swab specimens.
8. Using the tube layout report, scan the Q^x Swab Diluent Tube with black pierceable cap and place in order in the BD Viper™ LT Specimen Rack. If using the Lighted Login Rack, place specimen tube in the position that is lit on the Lighted Login Rack.
9. Specimens are ready to be pre-warmed.
10. **Change gloves** before proceeding to avoid contamination.

URINE SPECIMEN PROCESSING

NOTE: If specimens are refrigerated or frozen, make sure they are brought to room temperature and mixed by inversion prior to proceeding.

Processing procedure for the Q^x UPT

1. Make sure the urine volume in each Q^x UPT tube falls between the lines indicated on the tube label. Under or over filling the tube may affect assay performance. Over filling the tube may also result in liquid overflow on the BD Viper™ deck, and could cause contamination.
2. Make sure that the Q^x UPT Tube has a **black pierceable cap.**
3. Repeat steps 1 and 2 for additional Q^x UPT tube specimens.
4. Using the tube layout report, scan the Q^x UPT Tube with black pierceable cap and place in order in the BD Viper™ LT Specimen Rack. If using the Lighted Login Rack, place specimen tube in the position that is lit on the Lighted Login Rack.
5. Specimens are ready to be pre-warmed.
6. **Change gloves** before proceeding to avoid contamination.

Processing procedure for unpreserved (Neat) urine specimens

NOTE: Wear clean gloves when handling the urine specimen. If gloves come in contact with specimen, immediately change them to prevent contamination of other specimens.

1. Label a Specimen Tube for use on the BD Viper™ System with the patient identification and date/time collected.
2. Swirl the urine cup to mix the urine specimen and open carefully.

   NOTE: Open carefully to avoid spills which may contaminate gloves or the work area.
3. Uncap the tube and use a pipette to transfer the urine specimen into the tube. The correct volume of urine has been added when the fluid level is between the purple lines on the fill window located on the label. This volume corresponds to approximately 2.0–3.0 mL of urine. DO NOT overfill or under fill the tube.
4. Tighten a **black pierceable cap** securely on each tube.
5. Repeat steps 1 through 4 for each urine specimen. Use a new pipette or pipette tip for each sample.
6. Using the tube layout report, scan the Specimen Tube with black pierceable cap and place in order in the BD Viper™ LT Specimen Rack. If using the Lighted Login Rack, place tube in the position that is lit on the Lighted Login Rack.
7. Specimens are ready to be pre-warmed.
8. **Change gloves** before proceeding to avoid contamination.

NOTE: The pre-warm step must be started within 30 hours of collection if the urine has been stored at 2–30 °C; within 7 days of collection if stored at 2–8 °C; or within 180 days if stored frozen at -20 °C.

PROCESSING PROCEDURE FOR LBC SPECIMENS TRANSFERRED TO THE LBC SPECIMEN DILUTION TUBES

NOTE: If specimens are frozen, make sure they are thawed completely at room temperature and mixed by inversion prior to proceeding.

1. Make sure the LBC Specimen Dilution Tube has a pierceable cap.
2. Using the tube layout report, scan the LBC Dilution Tube with pierceable cap and place in order in the BD Viper™ LT Specimen Rack. If using the Lighted Login Rack, place tube in the position that is lit on the Lighted Login Rack.
3. Specimens are ready to be pre-warmed.
4. **Change gloves** prior to proceeding to avoid contamination.

QUALITY CONTROL PREPARATION

NOTE: Do not re-hydrate the controls prior to loading in the BD Viper™ LT Specimen Rack.

1. Using the tube layout report, scan the CT/GC Q^x Negative Control and place in the appropriate position in the BD Viper™ LT Specimen Rack. Likewise, scan the CT/GC Q^x Positive Control and place in the appropriate position in the BD Viper™ LT Specimen Rack. If using the Lighted Login Rack, place tube in the position that is lit on the Lighted Login Rack.
2. Using the tube layout report, place CT/GC Q^x Negative Controls into the appropriate positions in the BD Viper™ LT Specimen Rack.
3. Using the tube layout report, place CT/GC Q^x Positive Controls into the appropriate positions in the BD Viper™ LT Specimen Rack.
4. Controls are ready to be pre-warmed with the specimens, if desired.

PRE-WARM PROCEDURE SPECIMENS AND CONTROLS

NOTE: The pre-warm procedure must be applied to all specimens to ensure that the specimen matrix is homogeneous prior to loading on the BD Viper™ LT System. Failure to pre-warm specimens may have an adverse impact on performance of the BD ProbeTec™ CT/GC Q^x assays and/or BD Viper™ LT System.

NOTE: Refrigerated or frozen specimens must be brought to room temperature prior to pre-warming.

1. Insert the BD Viper™ LT Specimen Rack into the BD Pre-warm Heater. The BD Pre-warm Heater scanner reads the specimen rack barcode and begins the appropriate heating and cooling protocol.
2. When the Instrument indicates that the pre-warm cycle is complete, remove the BD Viper™ LT Specimen Rack from the BD Pre-warm Heater and load into the BD Viper™ LT instrument.
3. Refer to the Test Procedure for testing specimens and controls.
4. After pre-warming, urine and swab specimens may be stored for up to 7 days at 2–30 °C or up to 180 days at -20 °C without additional prewarming prior to testing on the BD Viper™ LT System. LBC specimens that have been pre-warmed may be stored for up to 7 days at 2–30 °C or up to 90 days at -20 °C without additional prewarming prior to testing on the BD Viper™ LT System.

TEST PROCEDURE

Refer to the BD Viper™ LT System User's Manual for specific instructions for operating and maintaining the components of the system. The optimum environmental conditions for the GC Q^x Assay were found to be18–27 °C and 20–85% Relative Humidity.

QUALITY CONTROL

Quality control must be performed in accordance with applicable local, state and/or federal regulations or accreditation requirements and your laboratory's standard Quality Control procedures. It is recommended that the user refer to pertinent CLSI guidance and CLIA regulations for appropriate Quality Control practices.

The Control Set for the BD ProbeTec™ CT/GC Q^x Amplified DNA Assays is provided separately. One Positive and one Negative Control must be included in each assay run and for each new reagent kit lot number. Controls must be positioned according to the BD Viper™ LT Instrument User's Manual. The CT/GC Q^x Positive Control will monitor for substantial reagent failure only. The CT/GC Q^x Negative Control monitors for reagent and/or environmental contamination. Additional controls may be tested according to guidelines or requirements of local, state, and/or federal regulations or accrediting organizations. Refer to CLSI C24-A3 for additional guidance on appropriate internal quality control testing practices.[13] The Positive Control contains approximately 2,400 copies per mL of pCTB4 and pGCint3 linearized plasmids. The Extraction Control (EC) oligonucleotide is used to confirm the validity of the extraction process. The EC is dried in the Extraction Tubes and is re-hydrated by the BD Viper™ LT System upon addition of the specimen and extraction reagents. At the end of the extraction process, the EC fluorescence is monitored by the instrument and an automated algorithm is applied to both the EC and *N. gonorrhoeae*-specific signals to report specimen results as positive, negative, or EC failure.

General QC Information for the BD Viper™ LT System:

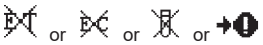
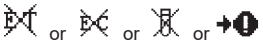
The location of the microwells is shown in a color-coded plate layout screen on the LCD Monitor. The plus symbol (+) within the microwell indicates the positive QC sample. The minus symbol (-) within the microwell indicates the negative QC sample. A QC pair must be logged in for each reagent kit lot number. If QC pairs have not been properly logged in, a message box appears that prevents saving the rack and proceeding with the run until complete. A maximum of two QC pairs per rack is permitted. Additional (optional) QC tubes for testing may be logged in. These tubes are tested as regular samples and do not affect the Pass/Fail status of the run. Refer to the BD Viper™ LT System User's Manual for instructions.

NOTE: The BD Viper™ LT System will re-hydrate the controls during the assay run. Do not attempt to hydrate the assay controls prior to loading them into the BD Viper™ LT Specimen Rack.

Interpretation of Quality Control Result:

The CT/GC Q^x Positive Control and the CT/GC Q^x Negative Control must test as positive and negative, respectively, in order to obtain patient results. If controls do not perform as expected, the run is considered invalid and patient results will not be reported by the instrument. If either of the controls does not provide the expected results, repeat the entire run using a new set of controls, new extraction tubes, new extraction reagent trough, and new microwells. If the repeat QC does not provide the expected results, contact BD Technical Service and Support. If the *N. gonorrhoeae*-specific signal is greater than or equal to a threshold of 125 Maximum Relative Fluorescent Units (MaxRFU), the EC fluorescence is ignored by the algorithm. If the *N. gonorrhoeae*-specific signal is less than a threshold of 125 MaxRFU, the EC fluorescence is utilized by the algorithm in the interpretation of the result.

Table 19: Interpretation of Quality Control Results

Control Type	Tube Result Report Symbol	GC Q^x MaxRFU	QC Disposition
GC Q^x Positive Control	OK	≥125	QC Pass
GC Q^x Positive Control		<125	QC Failure
GC Q^x Positive Control		Any value	QC Failure
GC Q^x Negative Control	OK	<125	QC Pass
GC Q^x Negative Control		≥125	QC Failure
GC Q^x Negative Control		Any value	QC Failure

Refer to the Interpretation of Test Results for a description of Tube Result Report symbols.

INTERPRETATION OF TEST RESULTS

The BD ProbeTec™ GC Q^x Amplified DNA Assay uses fluorescent energy transfer as the detection method to test for the presence of *N. gonorrhoeae* in clinical specimens. All calculations are performed automatically by the BD Viper™ LT software. The presence or absence of *N. gonorrhoeae* DNA is determined by calculating the peak fluorescence (MaxRFU) over the course of the amplification process and by comparing this measurement to a predetermined threshold value. The magnitude of the MaxRFU score is not indicative of the level of organism in the specimen. If the *N. gonorrhoeae*-specific signal is greater than or equal to a threshold of 125 MaxRFU, the EC fluorescence is ignored by the algorithm. If the *N. gonorrhoeae* -specific signal is less than a threshold of 125 MaxRFU, the EC fluorescence is utilized by the algorithm in the interpretation of the result. If assay control results are not as expected, patient results are not reported. See the Quality Control section for expected control values. Reported results are determined as follows.

Table 20: Interpretation of Test Results for the GC Q^x Assay

Tube Report Result	GC Q^x MaxRFU	Report	Interpretation	Result
	≥125	*N. gonorrhoeae* DNA detected by SDA.	Positive for *N. gonorrhoeae*. *N. gonorrhoeae* organism viability and/or infectivity cannot be inferred since target DNA may persist in the absence of viable	Positive
	<125	*N. gonorrhoeae* DNA not detected by SDA.	Presumed negative for *N. gonorrhoeae*. A negative result does not preclude *N. gonorrhoeae* infection because results are dependent on adequate specimen collection, absence of inhibitors, and the presence of sufficient DNA to be detected.	Negative
	<125	Extraction control failure. Repeat test from initial specimen tube or obtain another specimen for testing.	*N. gonorrhoeae*, if present, is not detectable.	Extraction Transfer Failure
	Any value	Extraction Transfer Failure. Repeat test from initial specimen tube or obtain another specimen for testing.	*N. gonorrhoeae*, if present, is not detectable.	Extraction Transfer Failure
	Any value	Liquid Level Failure. Repeat test from initial specimen tube or obtain another specimen for testing.	*N. gonorrhoeae*, if present, is not detectable.	Liquid Level Failure
	Any value	Error. Repeat test from initial specimen tube or obtain another specimen for testing.	*N. gonorrhoeae*, if present, is not detectable.	Error

SPECIMEN PROCESSING CONTROLS

Specimen Processing Controls may be tested in accordance with the requirements of appropriate accrediting organizations. A positive Specimen Processing Control tests the entire assay system. For this purpose, known positive specimens can serve as controls by being processed and tested in conjunction with unknown specimens. Specimens used as processing controls must be stored, processed, and tested according to the package insert instructions. If a known positive specimen is not available, additional options for Specimen Processing Controls are described below:

A. Preparation of Specimen Processing Controls in BD ProbeTec™ Q^x Swab Diluent

ATCC *Neisseria gonorrhoeae:*

Assay a stock culture of *N. gonorrhoeae* prepared as described below:

1. Thaw a vial of *N. gonorrhoeae* received from ATCC and immediately inoculate chocolate agar.
2. Incubate at 37 °C in 3–5% CO_2 for 24–48 hours. Resuspend colonies from the chocolate agar plate with phosphate buffered saline (PBS).
3. Dilute cells in PBS to a 1.0 McFarland turbidity standard (approximately 3 x 10^8 cells/mL).
4. Prepare 10-fold serial dilutions to a 10^{-5} dilution (at least 4 mL final volume) in PBS.
5. Place 0.1 mL of 10^{-5} dilution in a BD ProbeTec™ Q^x Swab Diluent tube and tightly recap using a black pierceable cap.
6. Using the tube layout report, place the Specimen Processing Control(s) in order in the BD Viper™ LT Specimen Rack.
7. Process the controls according to the Pre-warm Procedure and then follow the Test Procedure.
8. Specimen Processing Controls are ready to be tested on the BD Viper™ LT System.
9. **Change gloves** prior to proceeding to avoid contamination.

Bio-Rad AmpliTrol - *Chlamydia trachomatis* & *Neisseria gonorrhoeae*:

NOTE: Refer to manufacturer's processing instructions.

1. Add the appropriate volume of Bio-Rad AmpliTrol CT/GC to a BD ProbeTec™ Q^x Swab Diluent tube and tightly recap using a black pierceable cap.
2. Mix the solution by vortexing or with inversion.
3. Using the tube layout report, place the Specimen Processing Control(s) in order in the BD Viper™ LT Specimen Rack.
4. Process the controls according to the Pre-warm Procedure and then follow the Test Procedure.
5. Specimen Processing Controls are ready to be tested on the BD Viper™ LT System.
6. Change gloves prior to proceeding to avoid contamination.

B. Preparation of Specimen Processing Controls in LBC Specimen Dilution Tubes

ATCC *Neisseria gonorrhoeae*

1. Grow *N. gonorrhoeae* culture overnight on chocolate agar plates.
2. Resuspend *N. gonorrhoeae* colonies in phosphate buffered saline (PBS).
3. Prepare a 1.0 McFarland turbidity standard from the resuspended colonies.
4. Prepare 10-fold serial dilutions to a 10^{-5} dilution (at least 4 mL final volume) in phosphate buffered saline (PBS).
5. Place 0.1 mL of 10^{-5} dilution in an LBC Specimen Dilution Tube containing 0.5 mL of BD SurePath™ Preservative fluid or PreservCyt™ solution. Tightly recap the LBC Specimen Dilution Tube using the blue pierceable cap.
6. Invert the LBC Specimen Dilution Tube 3–4 times to ensure that the contents are well mixed.
7. Using the tube layout report, place the Specimen Processing Control (s) in order in the BD Viper™ LT Specimen Rack.
8. Process the controls according to the Pre-warm Procedure and then follow the Test Procedure.
9. Specimen Processing Controls are ready to be tested on the BD Viper™ LT System.
10. Change gloves prior to proceeding to avoid contamination.

Bio-Rad AmpliTrol - *Chlamydia trachomatis* & *Neisseria gonorrhoeae*

NOTE: Refer to manufacturer's processing instructions.

1. Add the appropriate volume of Bio-Rad AmpliTrol CT/GC to an LBC Specimen Dilution Tube containing 0.5 mL of BD SurePath™ Preservative Fluid or PreservCyt™ solution. Tightly recap the LBC specimen Dilution Tube using the blue pierceable cap.
2. Invert the LBC Specimen Dilution Tube 3–4 times to ensure that the contents are well mixed.
3. Using the tube layout report, place the Specimen Processing Control (s) in order in the BD Viper™ LT Specimen Rack.
4. Process the controls according to the Pre-warm Procedure and then follow the Test Procedure.
5. Specimen Processing Controls are ready to be tested on the BD Viper™ LT System.
6. Change gloves prior to proceeding to avoid contamination.

MONITORING FOR THE PRESENCE OF DNA CONTAMINATION

At least monthly, the following test procedure should be performed to monitor the work area and equipment surfaces for the presence of DNA contamination. Environmental monitoring is essential to detect contamination prior to the development of a problem.

1. For each area to be tested, use a clean collection swab from the BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens.
2. Pour off some molecular biology grade nuclease-free water into a small clean container.
3. Dip the swab into the molecular biology grade nuclease-free water and wipe the first area using a broad sweeping motion.
4. Remove the cap of a tube of Swab Diluent for the BD ProbeTec™ Q^x Amplified DNA Assays and insert the swab into the diluent. Mix by swirling the swab in the diluent for 5–10 seconds.
5. Express the swab along the inside of the tube so that liquid runs back into the bottom of the tube.
6. Remove the swab carefully from the **swab** diluent tube to avoid splashing. Discard the swab.
7. Tightly recap the diluent tube with the **black pierceable cap**.
8. Repeat for each desired area.
9. After all swabs have been collected and expressed, process them according to the Pre-warm Procedure and then follow the Test Procedure.

Consult the BD Viper™ LT System User's Manual for more information on Environmental Monitoring and Cleaning Procedures. If a contamination event does not resolve, contact BD Technical Service and Support for additional information.

LIMITATIONS OF THE PROCEDURE

1. This method has been tested only with endocervical, vaginal, male urethral swab specimens, BD SurePath™ or PreservCyt™ specimens collected with cytobrush/spatula or broom device, and male and female urine specimens. Performance with other specimen types has not been assessed.
2. Optimal performance of the test requires adequate specimen collection and handling. Refer to the "Specimen Collection and Transport" sections of this insert.
3. Endocervical specimen adequacy can only be assessed by microscopic visualization of columnar epithelial cells in the specimen.
4. Collection and testing of urine specimens with the BD ProbeTec™ GC Q^x Amplified DNA Assay is not intended to replace cervical exam and endocervical sampling for diagnosis of urogenital infection. Cervicitis, urethritis, urinary tract infections and vaginal infections may result from other causes or concurrent infections may occur.
5. The BD ProbeTec™ GC Q^x Amplified DNA Assay for male and female urine specimen testing should be performed on first catch random urine specimens (defined as the first 20–60 mL of the urine stream).
6. The effects of other potential variables such as vaginal discharge, use of tampons, douching, and specimen collection variables have not been determined.
7. A negative test result does not exclude the possibility of infection because test results may be affected by improper specimen collection, technical error, specimen mix-up, concurrent antibiotic therapy, or the number of organisms in the specimen which may be below the sensitivity of the test.
8. As with many diagnostic tests, results from the BD ProbeTec™ GC Q^x Amplified DNA Assay should be interpreted in conjunction with other laboratory and clinical data available to the physician.
9. The BD ProbeTec™ GC Q^x Amplified DNA Assay should not be used for the evaluation of suspected sexual abuse or for other medico-legal indications. Additional testing is recommended in any circumstance when false positive or false negative results could lead to adverse medical, social, or psychological consequences.
10. The BD ProbeTec™ GC Q^x Amplified DNA Assay cannot be used to assess therapeutic success or failure since nucleic acids from *N. gonorrhoeae* may persist following antimicrobial therapy.
11. The BD ProbeTec™ GC Q^x Amplified DNA Assay provides qualitative results. No correlation can be drawn between the magnitude of the positive assay signal (MaxRFU) and the number of cells in an infected sample.
12. The predictive value of an assay depends on the prevalence of the disease in any particular population.
13. Because the Positive Control for the BD ProbeTec™ CT/GC Q^x Amplified DNA Assays is used in testing for both *C. trachomatis* and *N. gonorrhoeae*, correct positioning of the microwell strips is important for final results reporting.
14. Use of the BD ProbeTec™ GC Q^x Amplified DNA Assay is limited to personnel who have been trained in the assay procedure and the BD Viper™ LT System.
15. The reproducibility of the BD ProbeTec™ GC Q^x Amplified DNA Assay was established on the BD Viper™ LT System using seeded simulated swab, urine and PreservCyt™ specimens. These specimens were inoculated with *C. trachomatis* and *N. gonorrhoeae*.
16. Performance has not been established for urine specimens in Q^x UPT when fill volumes other than those falling within the purple lines on the fill window (approximately 2.0–3.0 mL) are used.
17. The performance of the BD ProbeTec™ GC Q^x Amplified DNA Assay may cross-react with *N. cinerea* and *N. lactamica*. These organisms have only rarely been isolated from the genital tract.[14-17]
18. The performance of the BD ProbeTec™ GC Q^x Amplified DNA Assay with swab specimens was evaluated for interference by blood, gynecological lubricants, and spermicides. The performance with urine specimens was evaluated for interference by blood and commonly used over-the-counter pain relievers. No interference was observed with any of the substances at the concentrations tested.

19. The patient-collected vaginal swab specimens are an option for screening women when a pelvic exam is not otherwise indicated.
20. The patient-collected vaginal swab specimen application is limited to healthcare facilities where support/counseling is available to explain procedures and precautions.
21. The BD ProbeTec™ GC Q^x Amplified DNA Assay has not been validated for vaginal swab specimens collected by patients at home.
22. The performance of vaginal swab specimens has not been evaluated in patients less than 17 years of age.
23. The performance of vaginal swab specimens has not been evaluated in pregnant women.

PERFORMANCE CHARACTERISTICS

NOTE: The performance of the BD ProbeTec™ GC Q^x Assay on the BD Viper™ LT System was evaluated in an agreement study by comparing the assay results obtained on the BD Viper™ LT System with the results obtained on the BD Viper™ System in Extracted Mode.

Clinician-collected BD SurePath™ and PreservCyt™ specimens, patient-collected vaginal swab specimens (in a clinical setting), and male and female Q^x UPT urine specimens were collected from 653 female subjects and 170 male subjects attending OB/GYN, sexually transmitted disease (STD) and family planning clinics at four geographically diverse clinical sites in North America. Subjects were classified as symptomatic if they reported symptoms such as dysuria, urethral discharge, coital pain/difficulty/bleeding, testicular or scrotum pain/swelling, abnormal vaginal discharge, or pelvic/uterine/adnexal pain. Thirty-six female subjects and 3 male subjects were excluded from the data analysis due to opting to withdraw from the study after initially consenting or due to specimen or instrument level exclusion criteria. Urine quantity less than 20 mL, specimen processing errors, or transport and storage errors related to specimen collection also disqualified specimens. Therefore, the final data analysis included 617 compliant female subjects and 167 compliant
male subjects.

Eight specimens were collected from each of the 617 eligible female subjects, in the following order: (1) a first-void urine specimen, (2) 5 patient-collected vaginal swab specimens, and (3) BD SurePath™ and PreservCyt™ LBC specimens, collected according to manufacturer's recommendations. The LBC specimen collection was randomized throughout the study. The urine specimen was aliquoted into 5 Q^x UPTs prior to shipping to BD.

A first-void urine specimen was collected from each of the 167 eligible male subjects and split into 5 Q^x UPT tubes prior to shipping to BD. All specimens were shipped to BD on cold packs for specimen screening, aliquoting, and panel assembly.

All specimens were shipped to BD on cold packs to prepare panels of randomized positive and negative specimens (based on initial screening on the BD Viper™ system in Extracted Mode). Each specimen was aliquoted to prepare four identical panels; three panels were sent to three external sites for testing with the BD ProbeTec™ GC Q^x Amplified DNA Assay on the BD Viper™ LT instrument (one instrument at each site) and one panel was tested internally with the BD ProbeTec™ GC Q^x Amplified DNA Assay on the BD Viper™ System in Extracted Mode.

Positive percent agreement (PPA) and negative percent agreement (NPA) between the results obtained with the BD Viper™ LT and the results obtained with the BD Viper™ System in Extracted Mode were calculated. The summary of the results is presented in Table 21.

Table 21: PPA and NPA for the BD ProbeTec™ GC Q^x Assay on the BD Viper™ LT System

			Positive Percent Agreement		Negative Percent Agreement	
Gender	**Specimen Type**	**Site**	**Percent**	**95% CI***	**Percent**	**95% CI***
Female	Vaginal Swab	A	100.0% (27/27)	(87.5–100.0%)	94.9% (75/79)	(87.7–98.0%)
		B	96.3% (26/27)	(81.7–99.3%)	96.2% (76/79)	(89.4–98.7%)
		C	96.3% (26/27)	(81.7–99.3%)	96.2% 76/79)	(89.4–98.7%)
		Total	97.5% (79/81)	(92.6–100.0%)	95.8% (227/237)	(92.0–98.7%)
	Q^x UPT	A	96.3% (26/27)	(81.7–99.3%)	100.0% (79/79)	(95.4–100.0%)
		B	100.0% (27/27)	(87.5–100.0%)	100.0% (79/79)	(95.4–100.0%)
		C	96.3% (26/27)	(81.7–99.3%)	100.0% (79/79)	(95.4–100.0%)
		Total	97.5% (79/81)	(92.6–100.0%)	100.0% (237/237)	NA
	BD SurePath™	A	96.4% (27/28)	(82.3–99.4%)	100.0% (78/78)	(95.3–100.0%)
		B	96.4% (27/28)	(82.3–99.4%)	100.0% (78/78)	(95.3–100.0%)
		C	96.4% (27/28)	(82.3–99.4%)	98.7% (77/78)	(93.1–99.8%)
		Total	96.4% (81/84)	(89.3–100.0%)	99.6% (233/234)	(98.7–100.0%)
	PreservCyt™	A	100.0% (27/27)	(87.5–100.0%)	100.0% (79/79)	(95.4–100.0%)
		B	100.0% (27/27)	(87.5–100.0%)	100.0% (79/79)	(95.4–100.0%)
		C	100.0% (27/27)	(87.5–100.0%)	100.0% (79/79)	(95.4–100.0%)
		Total	100.0% (81/81)	NA	100.0% (237/237)	NA
	All	Total	97.9% (320/327)	(95.1–100.0%)	98.8% (934/945)	(97.9–99.6%)
Male	Q^x UPT	A	100.0% (40/40)	(91.2–100.0%)	100.0% (73/73)	(95.0–100.0%)
		B	100.0% (40/40)	(91.2–100.0%)	100.0% (73/73)	(95.0–100.0%)
		C	100.0% (40/40)	(91.2–100.0%)	98.6% (72/73)	(92.6–99.8%)
		Total	100.0% (120/120)	NA	99.5% (218/219)	(98.6–100.0%)
Total	All	Total	98.4% (440/447)	(96.4–100.0%)	99.0% (1,152/1,164)	(98.1–99.6%)

*The 95% Confidence Intervals were calculated using a bootstrap method.

NA: Not applicable. The bootstrap analysis method for estimating the 95% CI is not applicable when the total site agreement equals 100%.

GC Q^x Assay Analytical Sensitivity

The GC Q^x Assay formulation for the BD Viper™ LT System has not changed from that used with BD Viper™ System in Extracted Mode. This study was conducted on the BD Viper™ System in Extracted Mode and is presented in the “GC Q^x Assay Analytical Sensitivity” section for the BD Viper™ System in Extracted Mode.

GC Q^x Assay Analytical Specificity

The GC Q^x Assay formulation for the BD Viper™ LT System has not changed from that used with BD Viper™ System in Extracted Mode. This study was conducted on the BD Viper™ System in Extracted Mode and is presented in the “GC Q^x Assay Analytical Specificity” section for the BD Viper™ System in Extracted Mode.

GC Q^x Interfering Substances

The GC Q^x Assay formulation for the BD Viper™ LT System has not changed from that used with BD Viper™ System in Extracted Mode. This study was conducted on the BD Viper™ System in Extracted Mode and is presented in the "GC Q^x Assay Interfering Substances" section for the BD Viper™ System in Extracted Mode.

GC Q^x Specimen Stability:

The GC Q^x Assay formulation for the BD Viper™ LT System has not changed from that used with BD Viper™ System in Extracted Mode. This study was conducted on the BD Viper™ System in Extracted Mode and is presented in the "GC Q^x Assay Specimen Stability" section for the BD Viper™ System in Extracted Mode.

GC Q^x LBC Post Pre-warm Specimen Stability

Pools of CT and GC negative BD SurePath™ and PreservCyt™ LBC specimens diluted in LBC Dilution Tubes for the BD ProbeTec™ Q^x Amplified DNA Assays were used in analytical experiments to support the storage stability claims for pre-warmed LBC specimens. Pooled specimens were spiked with CT serovar H and GC strain ATCC 19424 at 90 EB/mL and 300 cells/mL, respectively, diluted in BD Q^x LBC Dilution Tubes. Both specimen types were pre-warmed and cooled using the CT/GC Q^x pre-warm procedure. Following the pre-warm procedure, specimen tubes were stored at either 2–8 °C for 3 or 7 days; or at 30 ± 2 °C for 3 or 7 days; or at -20 °C for 30 or 90 days. At each time point samples were removed from storage and tested with the BD ProbeTec™ GC Q^x Amplified DNA Assay on the BD Viper™ LT System. Twenty-four assay replicates were generated for each condition (sample type/temperature/duration). The expected results were obtained with the BD ProbeTec™ GC Q^x Amplified DNA Assay under all conditions tested.

Reproducibility

Reproducibility of the BD Viper™ LT System using the BD ProbeTec™ GC Q^x Amplified DNA Assay was evaluated at three test sites (two external clinical sites and one internal site) on one BD Viper™ LT System per site. Panels were comprised of three levels of CT and GC organisms seeded into PreservCyt™ matrix (0.5 mL spiked into LBC Dilution Tubes for the BD ProbeTec™ Q^x Amplified DNA Assays), vaginal matrix in Q^x Swab Diluent (containing a clean male urethral swab), and urine specimen matrix (in Q^x UPT). CT and GC organisms were spiked into each specimen matrix as follows: high negative (C_{20}-C_{80}), low positive (1.5x LoD), and moderate positive (3x LoD). Uninoculated PreservCyt™ matrix, vaginal matrix in Q^x Swab Diluent and urine matrix were used as negative samples. Two operators per site performed the BD Viper™ LT reproducibility study. Both operators ran one panel each day, over a total of eight days. A total of sixteen runs, each composed of 8 LBC, 8 swab and 8 UPT panel members described above were performed at each of two external BD Viper™ LT test sites and one internal BD Viper™ LT test site. The data are summarized in Table 22.

Table 22: Summary of Reproducibility Data for LBC, Swab, and Urine Matrix on the BD Viper™ LT System for the GC Q^x Assay

					Within Run		Between Run within Day		Between Day within Site		Between Site		Total	
Specimen Type	Panel	% Expected Results*	95% CI	Mean of Max RFU	SD	%CV	SD	%CV	SD	%CV	SD	%CV	SD	%CV
PreservCyt™ LBC	Negative**	100.0% (96/96)	(96.2–100.0%)	3.3	9.2	280.1	0.0	0.0	0.0	0.0	2.2	65.4	9.5	287.6
	High Negative**	20.8% 20/96)	(13.9–30.0%)	560.2	425.0	75.9	49.0	8.7	0.0	0.0	0.0	0.0	427.8	76.4
	Low Positive	100.0% (96/96)	(96.2–100.0%)	1,415.9	231.4	16.3	172.0	12.1	0.0	0.0	28.1	2.0	289.7	20.5
	Moderate Positive	100.0% (94/94*)	(96.1–100.0%)	1,631.9	169.7	10.4	93.7	5.7	70.9	4.3	0.0	0.0	206.4	12.6
Vaginal Swab	Negative**	99.0% (95/96)	(94.3–99.8%)	41.6	180.1	432.6	13.2	31.6	0.0	0.0	0.0	0.0	180.6	433.8
	High Negative**	13.5% (13/96)	(8.1–21.8%)	871.5	562.4	64.5	0.0	0.0	0.0	0.0	88.2	10.1	569.2	65.3
	Low Positive	100.0% (95/95*)	(96.1–100.0%)	1,687.5	297.7	17.6	0.0	0.0	0.0	0.0	34.7	2.1	299.7	17.8
	Moderate Positive	100.0% (96/96)	(96.2–100.0%)	1,819.2	163.3	9.0	48.2	2.7	43.3	2.4	73.3	4.0	190.3	10.5
Female UPT	Negative**	100.0% (96/96)	(96.2–100.0%)	3.6	8.0	221.8	0.0	0.0	0.0	0.0	0.0	0.0	8.0	221.8
	High Negative**	18.8% (18/96)	(12.2–27.7%)	766.6	502.1	65.5	0.0	0.0	75.8	9.9	15.8	2.1	508.0	66.3
	Low Positive	100.0% (96/96)	(96.2–100.0%)	1,593.6	224.9	14.1	86.6	5.4	36.7	2.3	0.0	0.0	243.8	15.3
	Moderate Positive	100.0% (96/96)	(96.2–100.0%)	1,741.5	126.1	7.2	86.2	5.0	35.1	2.0	21.5	1.2	158.2	9.1

* There were two moderate positive LBC samples and one low positive swab sample which resulted in an extraction transfer error and therefore no valid results were available for analysis.

**The results for negative panel members calculated according to an expected result of "negative for GC". All other panel members calculated according to an expected result of "positive for GC".

System Contamination

A study was conducted to evaluate the risk of producing a false positive result in either the same run on the BD Viper™ LT System or in a subsequent run. Negative and positive samples were tested on each of three BD Viper™ LT Systems. Negative samples consisted of Q^x Swab Diluent or LBC Specimen Dilution Tube with PreservCyt™ Solution. Positive samples consisted of a representative analyte (at 10^5 CT EBs/mL) spiked into Q^x Swab Diluent/LBC Specimen Dilution Tube with PreservCyt™ Solution. The overall rate of contamination (i.e., with alternating columns of positive and negative samples and a prevalence of 50%) was 0.32% (2/630) for Q^x Swab Diluent and 0.0% (0/630) for PreservCyt™ Solution. Contamination rates across the three BD Viper™ LT Systems are summarized in Table 23.

Table 23: System Contamination

BD Viper™ LT System	Q^x Sample Diluent			PreservCyt™ Solution		
	n	Positive Results	Percent Positive	n	Positive Results	Percent Positive
1	210	0	0.00%	210	0	0.00%
2	210	1	0.48%	210	0	0.00%
3	210	1	0.48%	210	0	0.00%
Overall	630	2	0.32%	630	0	0.00%

INTERPRETATION OF TABLES

Symbols and Abbreviations

Symbols

(+) positive
(-) negative
number
% percentage

Abbreviations

A Asymptomatic
CI Confidence Interval
CT *Chlamydia trachomatis*
CV Coefficient of Variation
E Equivocal
EC Extraction Control
ET Extraction Transfer Error
FN False Negative
FNU Female Neat Urine
FP False Positive
FS Female endocervical swab
FUPT Female urine in Q^x UPT
FV Female vaginal swab
GC *Neisseria gonorrhoeae*
HIV Human Immunodeficiency Virus
I Indeterminate
IFU Inclusion Forming Units
LBC Liquid Based Cytology
LE Liquid level error
LOD Limit of Detection
MaxRFU Maximum relative fluorescent units
MNU Male Neat Urine
MS Male urethral swab
MUPT Male urine in Q^x UPT
n number
NA non-applicable
NAAT Nucleic Acid Amplification Test
NPA Negative Percent Agreement
NPV Negative Predictive Value
OB/GYN Obstetrics/Gynecology
PA Percent Agreement
PBS Phosphate Buffered Saline
PIS Patient Infected Status

PPA	Positive Percent Agreement
PPV	Positive Predictive Value
QC	Quality Control
S	Symptomatic
SD	Standard Deviation
SDA	Strand Displacement Amplification
STD	Sexually Transmitted Disease
TN	True Negative
TP	True Positive
UPT	Urine Preservative Transport

AVAILABILITY

The following BD ProbeTec™ CT/GC Q^x and BD Viper™ products for use on the BD Viper™ LT are also available:

Catalog Number	Description
440724	BD Viper™ Pipette Tips, 960
441392	BD Viper™ Trash Box
441391	BD Viper™ Trash Bags
440818	BD Viper™ Trash Boxes and Bags
440974	BD Viper™ Tube Lockdown Cover
440975	BD Viper™ Lysing Heater (115V)
440976	BD Viper™ Lysing Heater (230V)
440977	BD Viper™ Lysing Rack
440984	Amplification Plate Sealers (Black)
441072	BD Viper™ Liquid Waste Bottle
441074	BD Viper™ Plate Seal Tool
441091	BD Viper™ System
441122	Vaginal Specimen Transport for the **BD ProbeTec**™ Q^x Amplified DNA Assays, 100 units
441124	BD ProbeTec™ GC Q^x Amplified DNA Assay Reagent Pack, 1152 tests
441126	BD ProbeTec™ CT Q^x Amplified DNA Assay Reagent Pack, 1152 tests
441125	Control Set for the BD ProbeTec™ CT/GC Q^x Amplified DNA Assays, 24 positive and 24 negative
441128	BD Viper™ Extraction Reagent and Lysis Trough, 12 Extraction Reagent Troughs and 12 Lysis Troughs
441129	BD FOX™ Extraction Tubes, 384 tests.
441354	BD Viper™ Neutralization Pouch, 12 pouches
441357	BD ProbeTec™ Q^x Collection Kit for Endocervical or Lesion Specimens, 100 units
441358	Male Urethral Specimen Collection Kit for the **BD ProbeTec**™ Q^x Amplified DNA Assays, 100 units
441359	Caps for use on the BD Viper™ (Extracted Mode), 4 x 100
441360	Specimen Tubes and Caps for use on the BD Viper™ (Extracted Mode), 4 x 100
441361	Swab Diluent for the BD ProbeTec™ Q^x Amplified DNA Assays, 2 mL x 48
441362	BD Urine Preservative Transport for the Q^x Amplified DNA Assays, 100 units
441444	Liquid Based Cytology Specimen (LBC) Dilution Tubes for the BD ProbeTec™ Q^x Amplified DNA Assays
441443	Liquid Based Cytology Specimen (LBC) Dilution Tube Caps for the BD ProbeTec™ Q^x Amplified DNA Assays
441996	BD Viper™ LT Pipette Tips, 3840
441941	BD Viper™ LT Solid Waste Liners, 80
442950	BD Pre-warm Heater
442958	BD Viper™ LT System SDA Accessory Kit
442839	BD Viper™ LT System
442842	BD ProbeTec™ GC Q^x Assay Gray Amp Reagent Pack, 384 tests
442959	BD ProbeTec™ CT Q^x Assay Gray Amp Reagent Pack, 384 tests
441994	BD Viper™ SDA Extraction Reagent Trough and Piercing Tool, 12 Extraction Reagent Troughs
441853	BD Viper™ System Accessories

The following strains are available from:

American Type Culture Collection (ATCC)
10801 University Boulevard
Manassas, VA 20110-2209, USA.
ATCC # VR-879 *Chlamydia trachomatis* (serotype H)
ATCC # VR-902B *Chlamydia trachomatis* LGVII
ATCC # 19424 *Neisseria gonorrhoeae*

Bio-Rad AmpliTrol CT/GC is available from:

Bio-Rad Laboratories (Blackhawk Biosystems)
12945 Alcosta Blvd. 2nd Floor
San Ramon, CA 94583
1-800-866-0305
AmpliTrol CT/GC # 00126

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Technical Service and Support: In the United States contact BD at 1.800.638.8663 or bd.com.

For regions outside of the United States, contact your local BD representative or bd.com.

EU Only: Users shall report any serious incident related to the device to the Manufacturer and National Competent Authority.

Outside EU: Contact your local BD representative for any incident or inquiry related to this device.

Refer to the Eudamed website: https://ec.europa.eu/tools/eudamed for Summary of Safety and Performance.

Change History

Revision	Sections/Date	Change Summary
(11)	EN All Title block	Remove notified body from CE mark
(12)	2022-04	Added CE Notified Body 2797 for IVDR 2017/746. Added Intended Use, Intended User, Material Provided, Serious Incident statement and Safe Disposal statement. Added IVD, eIFU with URL, Do not Reuse, Do not use if Package is Damaged and Rx Only symbol. Updated Australian and New Zealand Sponsor addresses. Updated EC REP address. Updated Technical Information and Eudamed link. Updated Symbols Glossary and BD Trademark. Added CH REP symbol and address. Updated GHS information. Updated Availability section.

SYMBOLS GLOSSARY [L006715(06) 2021-08]

Some symbols listed below may not apply to this product.

US Customers only: For symbol glossary, refer to **bd.com/symbols-glossary**

Symbol	Meaning
	Manufacturer
	Authorized representative in the European Community
	Authorised representative in Switzerland
	Date of manufacture
	Use-by date
	Batch code
	Catalogue number
	Serial number
	Sterile
	Sterilized using aseptic processing techniques
	Sterilized using ethylene oxide
	Sterilized using irradiation
	Sterilized using steam or dry heat
	Do not resterilize
	Non-sterile
	Do not use if package is damaged and consult *instructions for use*
	Sterile fluid path
	Sterile fluid path (ethylene oxide)
	Sterile fluid path (irradiation)
	Fragile, handle with care
	Keep away from sunlight
	Keep dry
	Lower limit of temperature
	Upper limit of temperature
	Temperature limit
	Humidity limitation
	Biological risks
	Do not re-use
	Consult instructions for use or consult electronic *instructions for use*
	Caution
	Contains or presence of natural rubber latex
	In vitro diagnostic medical device
	Negative control
	Positive control
	Contains sufficient for <*n*> tests
	For IVD performance evaluation only
	Non-pyrogenic

Symbol	Meaning
	Patient number
	This way up
	Do not stack
	Single sterile barrier system
	Contains or presence of phthalate: combination of bis(2-ethylhexyl) phthalate (DEHP) and benzyl butyl phthalate (BBP)
	Collect separately Indicates separate collection for waste of electrical and electronic equipment required.
	CE marking; Signifies European technical conformity
	Device for near-patient testing
	Device for self-testing
	This only applies to US: "Caution: Federal Law restricts this device to sale by or on the order of a licensed practitioner."
	Country of manufacture "CC" shall be replaced by either the two letter or the three letter country code.
	Collection time
	Cut
	Peel here
	Collection date
	Keep away from light
	Hydrogen gas is generated
	Perforation
	Start panel sequence number
	End panel sequence number
	Internal sequence number
	Medical device
	Contains hazardous substances
	Ukrainian conformity mark
	Meets FCC requirements per 21 CFR Part 15
	UL product certification for US and Canada
	Unique device identifier

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