

Assay Training: Xpert[®] Xpress Strep A

For CE-IVD Use Only





Training Agenda

- **Xpert Xpress Strep A**
 - Reagents
 - Sample collection
 - Kit storage and handling
 - Preparing the cartridge
 - Quality controls
 - Results analysis
- **Discussion**





Training Objectives

- **At the end of the training, users will be able to:**
 - Store and handle the Xpert[®] Xpress Strep A cartridge kit and sample collection kit
 - Follow proper laboratory safety precautions
 - Collect and transport an appropriate specimen
 - Prepare a cartridge and run the Xpert Xpress Strep A Assay
 - Report the various software generated results
 - Understand the Xpert Xpress Strep A control strategy

The Cepheid Solution



- Detection of *Streptococcus pyogenes* DNA
- On-board internal controls for each sample
 - Probe Check Control (PCC)
 - Specimen Processing Control (SPC)
- Closed cartridge system minimizes risk of contamination
- Early Assay Termination
- On-demand results
- Random access

Intended Use

- The Xpert Xpress Strep A Assay, performed on the GeneXpert® Instrument Systems, is a rapid, qualitative *in vitro* diagnostic test for the detection of *Streptococcus pyogenes* (Group A β -hemolytic *Streptococcus*, Strep A) in throat swab specimens from patients with signs and symptoms of pharyngitis.
- The Xpert Xpress Strep A Assay utilizes an automated real-time polymerase chain reaction (PCR) to detect *Streptococcus pyogenes* DNA.

Xpert Xpress Strep A Requirements

GeneXpert Systems

- GeneXpert Dx Software v4.7b or higher
- Xpertise Software v6.4b or higher

Test Kits

- XPRSTREPA-CE-10

Sample Collection (required but not provided)

- Copan Liquid Amies Elution Swab (ESwab™) Collection and Transport System (Copan 480CE or Copan 480C)

Other materials

- Personal Protective Equipment (PPE)
- 1:10 dilution of Bleach
- 70% ethanol or denatured ethanol

Optional

- Uninterruptible Power Supply/ Surge Protector
- Printer



Good Laboratory Practice

Personnel Protective Equipment (PPE)

- Wear clean lab coat and gloves
- Change gloves between processing samples

Lab Bench area

- Clean work surfaces routinely with:
 - ✓ 1:10 dilution of household bleach
 - ✓ 70% Ethanol Solution
- After cleaning, ensure work surfaces are dry

Specimens, Samples, and Kits Storage

- Store specimens and sample away from kit to prevent contamination

Equipment

- Use filtered pipette tips when recommended
- Follow the manufacturer's requirements for calibration and maintenance of equipment

Kit Contents, Storage, and Handling



Xpert Xpress Strep A Kit Contents

	Xpert Xpress Strep A
Catalog Number	XPRSTREPA-CE-10
Cartridges Per Kit	10
Transfer Pipettes	12
CD	Xpert Xpress Strep A Assay Definition File (ADF)
	Assay Definition File Import Instructions
	Package Insert



Cartridges contain chemically hazardous substances-please see Package Insert and Safety Data Sheet for more detailed information.



Xpert Xpress Strep A Kit Storage and Handling

- Store the Xpert Xpress Strep A cartridges and reagents at **2–28°C**
- Follow your institution's safety procedures for working with chemicals and handling biological samples
- Open the Xpert Xpress Strep A cartridge lid only when adding the sample, close the lid, and proceed with processing





Warnings and Precautions

- Do not shake the cartridge
- Do not use a cartridge that:
 - appears wet, has leaked, or if the lid seal appears to have been broken
 - appears damaged
 - has been dropped after removing it from packaging
 - has been dropped or shaken after adding the sample to it
 - has a damaged reaction tube
 - has been used; each cartridge is single-use to process one test
 - has expired
- Do not reuse pipettes

Xpert Xpress Strep A Limitations

- The Xpert Xpress Strep A has been validated only with throat swabs using Cepheid's recommended procedure as per the package insert.
- Mutations or polymorphisms in primer or probe binding regions may affect detection of new or unknown *Streptococcus pyogenes* strains, resulting in a false negative result.

For detailed information, refer to the current Package Insert

Specimen Collection, Storage, and Transport





Throat Swab Specimen Collection

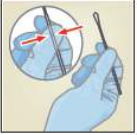
Throat Swab Specimen Collection


Xpert Xpress Strep A


- 1 Use the ESwab Collection and Transport System (Copan 480C or 480CE).



- 2 Remove the swab, taking care not to touch the tip of the swab or lay it down.



- 3 Hold the swab in your hand, placing your thumb and forefinger in the middle of the swab shaft across the scoreline.


- 4 Gently swab the posterior pharynx, tonsils or other inflamed areas as shown. Avoid touching the tongue, cheeks and teeth with the swab when collecting the specimens.


- 5 Remove the cap from the tube. Do not place the cap open side down or touch the inside of the cap. Insert the swab into the transport medium containing tube.


- 6 Break the swab shaft at the pre-scored line by bending it against the tube wall.


- 7 Replace the cap onto the tube and close tightly.


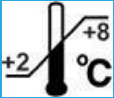

- 8 Specimen Transport and Storage Temperature (°C)
15–30 °C up to 48 hours
2–8 °C up to 6 days

Throat Swab Specimen Collection

Use the ESwab Liquid-based Collection and Transport System (Copan 480CE or Copan 480C)

1. Remove the swab from the wrapper
2. Swab the posterior pharynx, tonsils, and other inflamed areas
Avoid touching the tongue, cheeks, and teeth with the swab when collecting specimens
3. Uncap the transport medium containing tube
4. Place the swab into transport tube containing Liquid Amies Transport Medium and break the swab at indicated score line
Note: Do not place multiple swabs in the transport tube.
5. Cap the transport medium tube

Specimen Transport and Storage

Specimen Collection Device	Specimen Transport and Storage Temperature (°C)	Specimen Storage Time
ESwab (Copan 480CE or Copan 480C)	15–30 °C 	Up to 48 hours
	2–8 °C 	Up to 6 days



Cartridge Preparation



Xpert Xpress Strep A Cartridge Preparation

Xpert® Xpress Strep A Cartridge Preparation

- Xpert Xpress Strep A

Refer to the package insert for detailed instructions, precautions, and warnings.

For a copy of the SDS, visit www.cepheid.com or www.cepheidinternational.com

Cepheid Technical Support
US office
(888) 838-3222, Option 2
techsupport@cepheid.com

European office
+33 563 825 319
support@cepheideurope.com



- 1 Take one cartridge and a 300 μ L transfer pipette (provided).



© 2018 Cepheid

- 2 Vigorously shake the transport tube for 5 seconds.



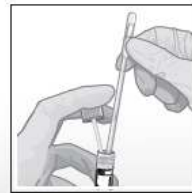
- 3 Open the cartridge lid.



- 4 Unscrew the cap (do not remove the cap).



- 5 Lift the cap with the attached swab, if applicable. Aspirate 300 μ L of the sample (one draw).



- 6 Empty the pipette into the sample chamber of the cartridge.

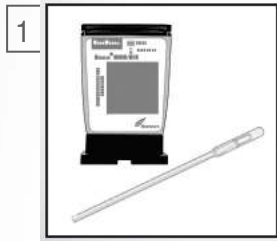


- 7 Close the cartridge lid.



301-6495, Rev. B May 2018

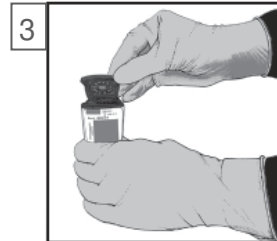
Xpert Xpress Strep A Cartridge Preparation



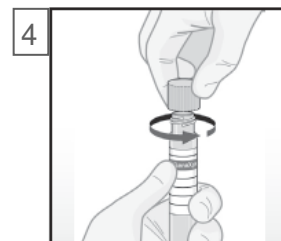
1 Take one cartridge and a 300µL transfer pipette (provided).



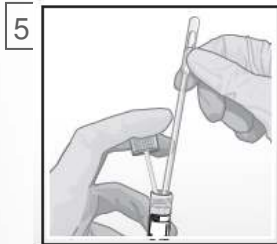
2 Vigorously shake the transport tube for 5 seconds.



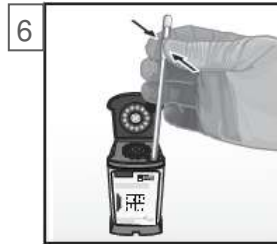
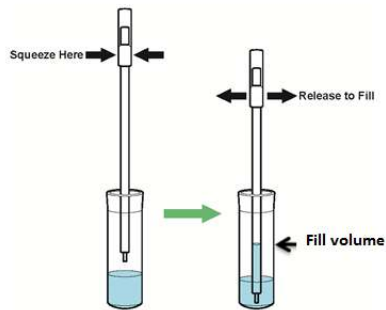
3 Open the cartridge lid.



4 Unscrew the cap (do not remove the cap).



5 Lift the cap with the attached swab, if applicable. Aspirate 300µL of the sample (one draw).



6 Empty the pipette into the sample chamber of the cartridge.



7 Close the cartridge lid.

Run a Test

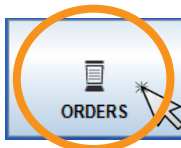
1 Create Test

GeneXpert



Start the test within 30 minutes of adding the sample to the cartridge

GeneXpert
Infinity



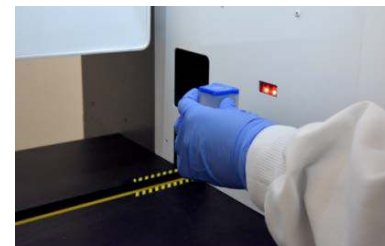
Place the cartridge on the conveyor within 30 minutes of adding the sample to the cartridge

2 Scan barcodes: Cartridge/ Patient and/or Sample ID



*By default, do not click on
Manual Entry or Cancel*

3 Scan the cartridge



"For complete details on how to run a test, refer to the Package Insert and the GeneXpert Dx or Xpertise Operator Manuals.

Create a Test on GeneXpert Dx Software

4 Complete the fields as required

5 The Xpert Xpress Strep A Protocol is selected automatically after the cartridge is scanned

6 The module is selected automatically

7 Click on Start Test

8 A green light will flash on the module
Load the cartridge into module and close the door

The screenshot shows the 'Create Test' software window. It contains several input fields and dropdown menus. An orange box highlights the top four input fields: Patient ID, Sample ID, Patient ID 2, and Last Name. Another orange box highlights the 'Select Assay' dropdown menu, which is set to 'Xpert Xpress Strep A'. A third orange box highlights the 'Select Module' dropdown menu, which is set to 'A3'. A fourth orange box highlights the 'Start Test' button at the bottom right of the window. A mouse cursor is pointing at the 'Start Test' button. The 'Start Test' button is highlighted with an orange box. The 'Scan Cartridge Barcode' button is also visible next to it.



Create a Test on Xpertise Software

4 Complete the fields as required

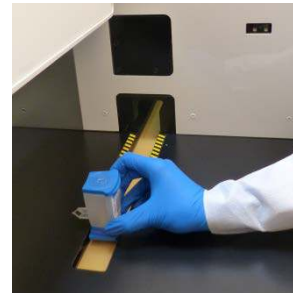
5 The Xpress Strep A protocol is selected automatically

6 Click on SUBMIT

7 Place the cartridge into the conveyor belt

Order Test - Test Information

Patient ID patientid	
Sample ID sampleid	
Last Name patient	First Name id
Assay* Xpert Xpress Strep A	
Reagent Lot ID* 12102	Cartridge S/N* 282769448
Expiration Date* 2018/11/04	Priority Normal
Test Type Specimen	Other Sample Type*
Sample Type Other	
Notes	





Automated Xpert Protocol



Waste Disposal

- Biological specimens, specimen collection devices, and used cartridges should be considered capable of transmitting infectious agents and require use of standard precautions.
- Follow your institution's environmental waste procedures for proper disposal of used cartridges and unused reagents. These materials may exhibit characteristics of chemical hazardous waste requiring specific national or regional disposal procedures.
- If national or regional regulations do not provide clear direction on proper disposal, biological specimens and used cartridges should be disposed per WHO [World Health Organization] medical waste handling and disposal guidelines.

Quality Controls





Instrument System Control – Check Status

- System control checks the optics, temperature of the module, and mechanical integrity of each cartridge.
 - If the system controls fail, an ERROR test result will be reported.



Xpert Xpress Strep A Control Strategy

CONTROL

- Each Xpert cartridge is a self-contained test device
- Cepheid designed specific molecular methods to include internal controls that enable the system to detect specific failure modes within each cartridge
 - Probe Check Controls (PCC)
 - Sample Processing Control (SPC)



Internal Quality Controls

- **Probe Check Controls (PCC)**

- Before the PCR step, fluorescence signal is measured on all probes and compared with default factory settings to monitor
 - bead rehydration
 - reaction tube filling
 - probe integrity
 - dye stability

- **Sample Processing Controls (SPC)**

- Verifies adequate sample processing
- Detects PCR inhibition
- Should be positive in a negative sample
- Can be positive or negative in a positive sample

Commercially Available External Controls

Vendor	Part Number	Configuration	Storage
ZeptoMetrix	NATSPY-6MC (Positive Control)	0.5mL	2-8°C
	NATSDG-6MC (Negative Control)	0.5mL	2-8°C

1. Take 1 vial of the control material and shake vigorously for 5 seconds.
2. Open the cartridge lid.
3. Using a transfer pipette included in the Xpert Xpress Strep A kit, transfer 300ul of the control to the sample chamber of the cartridge.
4. Close the lid and launch the test on GeneXpert.

To minimize degradation of the control material, return any unused sample to the recommended storage conditions immediately after use.

- Many other vendors for quality control material are also available in addition to the one outlined above.
- External controls should be used in accordance with local, state accrediting organizations, as applicable

Result Interpretation



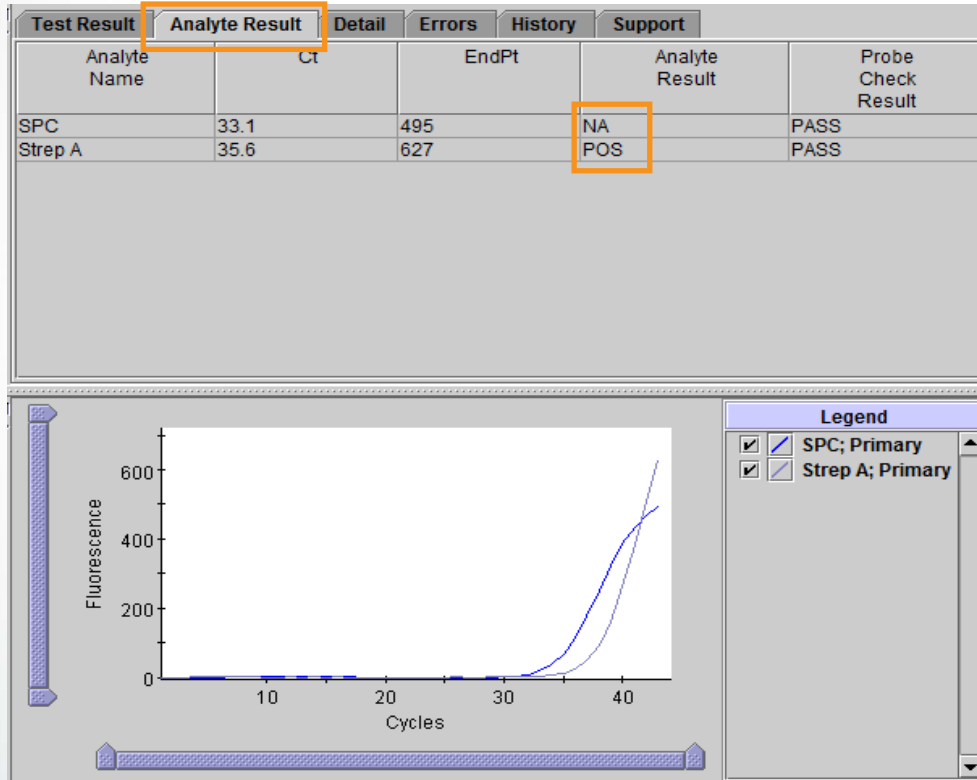


Results Summary

Result displayed	Strep A	SPC
Strep A DETECTED	+	+/-
Strep A NOT DETECTED	-	+
INVALID	-	-
ERROR	NO RESULT	NO RESULT
NO RESULT	NO RESULT	NO RESULT

Strep A DETECTED

Test Result **Strep A DETECTED**

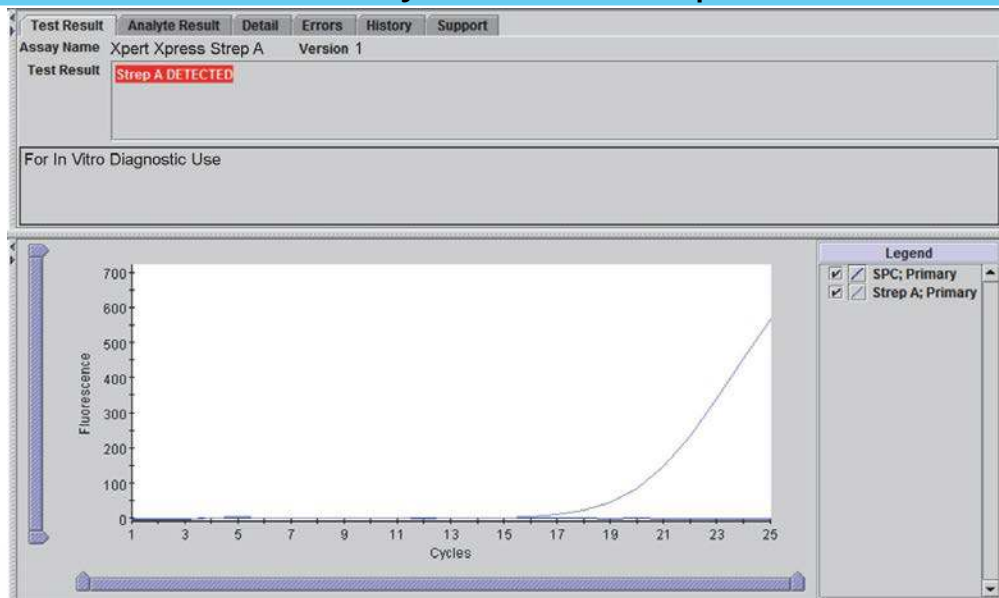


The Strep A target is present within the sample:

- SPC: NA (not applicable). An SPC signal is not required because Strep A amplification can compete with this control.
- Probe Check: PASS

Early Assay Termination (EAT)

- Positive results can be available earlier than 24 minutes (dependent on sample titer)
- EAT activated when pre-determined threshold for a positive test result is reached before 43 PCR cycles are completed



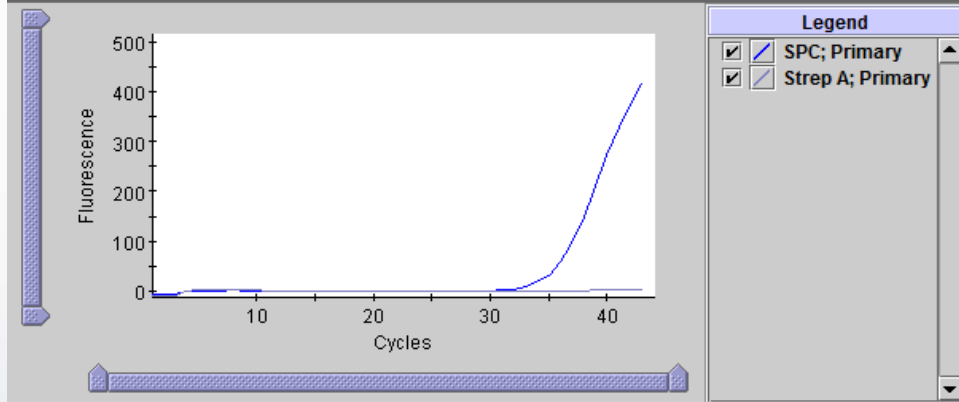
Strep A NOT DETECTED

Test Result **Strep A NOT DETECTED**

Analyte Name	Ct	EndPt	Analyte Result	Probe Check Result
SPC	35.2	416	PASS	PASS
Strep A	0.0	3	NEG	PASS

The Strep A target is NOT detected within the sample:

- SPC: PASS. The SPC met the acceptance criteria.
- Probe Check: PASS



Troubleshooting



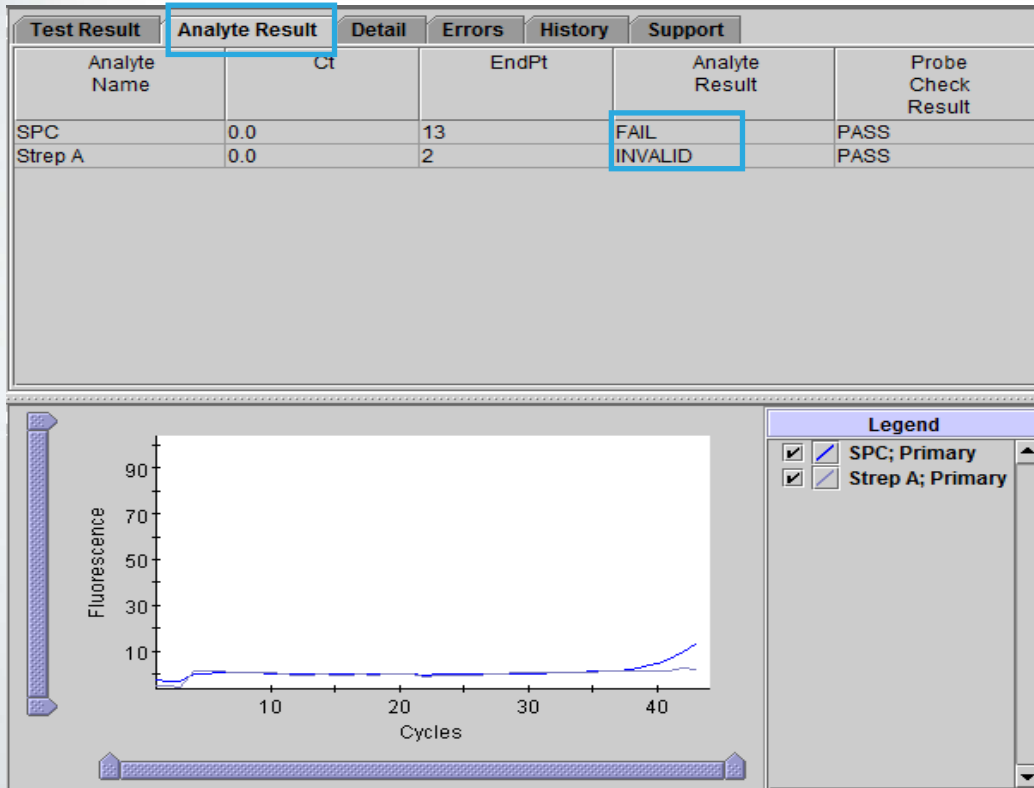


Factors That Negatively Affect Results

- Improper specimen collection
 - The bacterial load in the specimen is below the detection limit of the test
- Improper transport or storage of collected specimen
 - Storage and transport conditions are specimen specific
 - Refer to the Package Insert for the appropriate handling instructions
- Improper testing procedure
 - Modification to the testing procedures may alter the performance of the test
 - Careful compliance with the package insert is necessary to avoid erroneous results

INVALID Result

Test Result **INVALID**



The presence or absence of Strep A target cannot be determined

- SPC: FAIL. The SPC does not meet the acceptance criteria.
- Probe Check: PASS

Possible Causes

- Improper sample collection
- Incorrect sample preparation
- Improper storage of the cartridges
- Inefficient sample processing in cartridge
- Presence of interfering substances in the sample

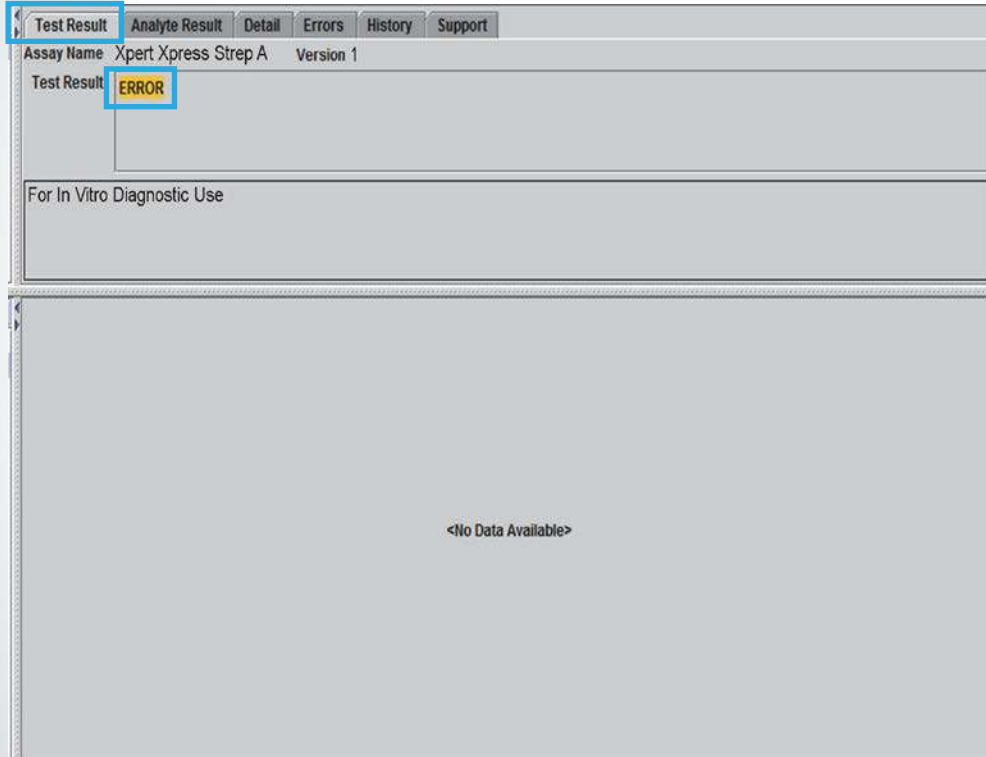
Solution

- Repeat the test with a new cartridge and new sample

Please refer to the package insert and Operator Manual for more complete information

ERROR

Test Result **ERROR**



The presence or absence of Strep A cannot be determined

- Strep A: NO RESULT
- SPC: NO RESULT

Possible Causes

If Probe Check: FAIL

- Missing primer/probe or enzyme beads
- Incomplete bead rehydration
- Incomplete reaction tube filling
- Issues with the probe integrity or dye stability

If Probe Check: PASS

- Check the GeneXpert System module
- Maximum pressure limit exceeded the acceptable range

Solution

- Repeat the test with a new cartridge and sample

Please refer to the package insert and Operator Manual for more complete information

NO RESULT

Test Result **NO RESULT**

The screenshot shows the software interface for the Xpert Xpress Strep A assay. At the top, there are tabs for 'Test Result', 'Analyte Result', 'Detail', 'Errors', 'History', and 'Support'. Below the tabs, the 'Assay Name' is 'Xpert Xpress Strep A' and the 'Version' is '1'. The 'Test Result' field displays 'NO RESULT'. Below this, there is a section for 'For In Vitro Diagnostic Use'. The main area of the screen is mostly blank, with the text '<No Data Available>' centered at the bottom.

The presence or absence of Strep A cannot be determined.

- Strep A: NO RESULT
- SPC: NO RESULT
- Probe Check: NA (not applicable)

Possible Cause

A NO RESULT indicates that insufficient data were collected.

- Test was stopped with stop test button
- Electrical failure

Solution

- Secure the power
- Repeat the test with a new cartridge and sample

Please refer to the package insert and Operator Manual for more complete information

Xpert Xpress Strep A Retest Procedure

1

Discard used cartridge

Follow your institution's safety guidelines for disposal of cartridges

2



Obtain the residual sample, mix according to Package Insert

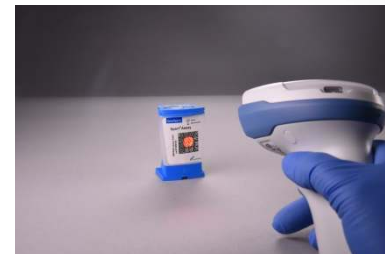
If the leftover sample volume is insufficient, or the retest continues to return an INVALID, ERROR, or NO RESULT, collect a new sample

3

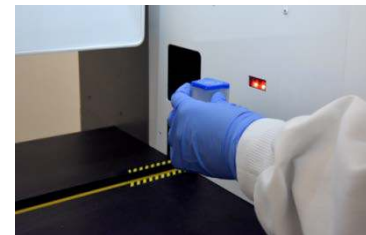


Obtain a new cartridge
Process the sample per the package insert

4



Run the test on the System



Technical Assistance

- Before contacting Cepheid Technical Support, collect the following information:
 - Product name
 - Lot number
 - Serial number of the System
 - Error messages (if any)
 - Software version and, if applicable, Computer Service Tag number
- Log your complaint online using the following link <http://www.cepheid.com/us/support> : *Create a Support Case*

Region	Telephone	Technical Support Email
US	+ 1 888 838 3222	techsupport@cepheid.com
Australia and New Zealand	+ 1800 130 821 (AU) + 0800 001 028 (NZ)	techsupportANZ@cepheid.com
Brazil and Latin America	+ 55 11 3524 8373	latamsupport@cepheid.com
China	+ 86 021 5406 5387	techsupportchina@cepheid.com
France	+ 33 563 825 319	support@cepheideurope.com
Germany	+ 49 69 710 480 480	support@cepheideurope.com
India, Bangladesh, Bhutan, Nepal, and Sri Lanka	+ 91 11 48353010	techsupportindia@cepheid.com
Italy	+ 39 800 902 567	support@cepheideurope.com
South Africa	+ 27 861 22 76 35	support@cepheideurope.com
United Kingdom	+ 44 3303 332 533	support@cepheideurope.com
Belgium and Netherlands	+33 563 825 3319	support@cepheideurope.com
Other European, Middle East, and African countries	+ 33 563 825 319 + 971 4 253 3218	support@cepheideurope.com



Thank You.

www.Cepheid.com

