EVALUATION OF AUTOMATIC CLASS III DESIGNATION FOR
Teal Wand
DECISION SUMMARY

I Background Information:

A De Novo Number

DEN240045

B Applicant

Teal Health, Inc.

C Proprietary and Established Names

Teal Wand

D Regulatory Information

Product Code(s)	Classification	Regulation Section	Panel
SEP	Class II	21 CFR 866.2920 - Device for home collection and transportation of clinical specimens by lay users for infectious disease testing	MI - Microbiology

II Submission/Device Overview:

A Purpose for Submission:

De Novo request for evaluation of automatic class III designation for the Teal Wand

III Indications for Use:

A Indication(s) for Use:

The Teal Wand is a device for the self-collection of vaginal specimens for the purpose of collecting and transporting specimens for use in an FDA approved HPV molecular assay with which the collection device has been validated.

The Teal Wand can be used at-home or in any private setting. Specimens can be collected, stored, and shipped dry in an empty vial.

Food and Drug Administration
10903 New Hampshire Avenue
Silver Spring, MD 20993-0002
www.fda.gov

B Special Conditions for Use Statement(s):

Rx - For use at home or similar environment by prescription only.

Performance characteristics of this device have only been validated with the cobas HPV on the cobas 5800/6800/8800 Systems (P190028/S009).

C Special Instrument Requirements:
Not applicable.

IV Device/System Characteristics:

A Device Description:
The Teal Wand is a single patient use device intended for a person to self-collect vaginal specimens. The device consists of a plastic casing containing a swab-like projection with a foam sponge that is designed to collect the vaginal specimen. Also included are: an empty polypropylene specimen vial with a label for patient name, date of birth, and collection date, nitrile gloves, pen, product information including Instructions for Use, rigid safety bag, and return mailer. The self-collected specimen is then transported dry to a laboratory for processing and subsequent downstream high-risk HPV molecular testing as per the assay manufacturer's instructions.

B Principle of Operation
Teal Wand is designed for a patient to insert the device into her vaginal canal with the rotor/dial located in the handle of the Wand facing upward in her palm. The dial deploys the petals at the end of the Wand into a mini-speculum to expose the collection sponge to the vaginal area and also serves to rotate the sponge to gently collect the cells for analysis. The dial serves also to allow the user to retract the sponge for device withdrawal (Figure 1).

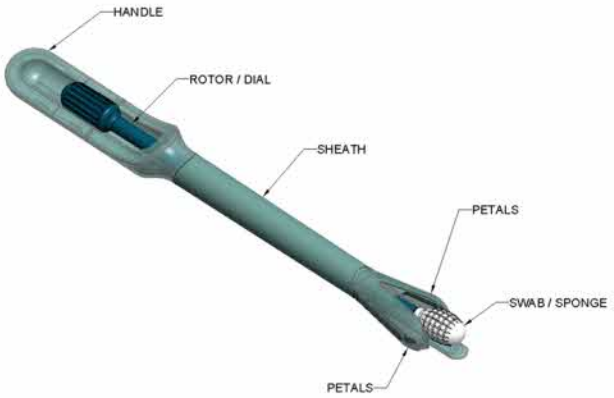

Figure 1. Teal Wand in Open Configuration (in use)

The patient, following instructions for use, will insert the device into her vaginal opening. Once the device is in place, the patient slides the dial in the handle upwards and rotates the dial 10 times in one direction (the device will rotate in either direction). Upon rotation of the dial, the patient should retract the dial by returning it to the starting position to bring the sponge back into the device sheath. The device should then be removed by sliding it out of the vagina.

The patient then extends the collection sponge to allow its removal and places it into an empty vial for dry collection and shipment to the laboratory. The remainder of the Teal Wand is to be disposed of in the normal trash. Once at the laboratory, the sponge is placed into a 20 mL vial of PreservCyt medium (Hologic ThinPrep) to elute the specimen into the liquid. The specimen is then processed according to manufacturer's instructions for the cobas HPV assay.

V Standards/Guidance Documents Referenced:

ISO 10993-1, Biological evaluation of medical devices — Part 1: Evaluation and testing within a risk management process.

ISO 10993-5, Biological evaluation of medical devices — Part 5: Tests for in vitro cytotoxicity.

ISO 10993-7, Biological evaluation of medical devices — Part 7: Ethylene oxide sterilization residuals.

ISO 10993-10, Biological evaluation of medical devices — Part 10: Tests for skin sensitization.

ISO 10993-23, Biological evaluation of medical devices — Part 23: Tests for irritation.

CDRH Guidance - Applying Human Factors and Usability Engineering to Medical Devices, February 3, 2016.

CDRH Guidance - Shelf Life of Medical Devices, April 1991.

VI Performance Characteristics:

A Analytical Performance:

1. Precision/Reproducibility:

   Not applicable.

2. Linearity:

   Not applicable.

3. Analytical Specificity/Interference:

   Interfering Substances
   A study was performed to evaluate whether substances (hand contaminants) commonly used by lay users in home settings may interfere with the detection of HPV using Teal Wand collected vaginal specimens. The interfering substances, diluted in HPV negative self-collected clinical vaginal matrix (CVM), were inoculated onto Teal Wands and tested alone and also in the presence of HPV 16 and 18. The samples were prepared at low positive concentrations (3x LoD) of SiHa (HPV16) and HeLa (HPV18) cell lines and tested in 5 replicates. The following substances were tested at 1% v/v concentration using cobas HPV assay. No interference was observed with the following substances tested.

Table 1. Potentially Interfering Substances

Category	Brand	Agreement with expected results	
		SiHa (HPV16)	HeLa (HPV18)
Lotions	Jergens	(5/5) 100%	(5/5) 100%
	Aveeno	(5/5) 100%	(5/5) 100%
Hand sanitizer	GermX	(5/5) 100%	(5/5) 100%
	Purell	(5/5) 100%	(5/5) 100%
Hand soap	SoftSoap	(5/5) 100%	(5/5) 100%
	Dial	(5/5) 100%	(5/5) 100%

Please see P190028/S009 labeling for additional interference testing.

4. Assay Reportable Range:

Not applicable.

5. Traceability, Stability, Expected Values (Controls, Calibrators, or Methods):

Shelf-life Stability
Teal Wands underwent stability testing after real time ageing for one year. The Teal Wands, containing the sponges, were stored in sealed Tyvek pouches in ambient conditions ranging from 60°F to 93°F and 23% to 74% relative humidity. Stability testing assessed mechanical robustness of the Wand using parameters such as force to deploy, torque to rotate, force to retract rotor, deployment cycle testing, swab pull off force, and speculum/petal spread width. A separate study was conducted on foam sponge components of the Teal Wand to assess foam shear force after one year after manufacturing. The data from multiple lots in both studies demonstrate that the Teal wand is stable up to one year when stored at 59°F to 86°F.

Sample Shipping Stability
A sample shipping stability study was conducted for a period of 154 hours to evaluate the stability of vaginal specimens collected with Teal Wand, when exposed to conditions representing extreme cold and hot temperatures for durations anticipated during a 130-hour (5-day) shipping period from the time of collection and an additional 24 hour wait time in the lab. Replicates of HPV-negative pooled CVM (n=11) and positive samples [SiHa (HPV16) and HeLa (HPV18) cell lines spiked in pooled CVM] at 2x LoD (n=33) and 10x LoD (n=11) were inoculated onto Teal Wand and tested, first at baseline, and also following exposure to the temperature profiles (cold and hot). Expected results were obtained for all negative and positive samples at all conditions.

6. Limit of Detection at the Clinical Cutoff:
The Limit of Detection (LoD) at the clinical cutoff for HPV16 and HPV18 was determined using SiHa (HPV16) and HeLa (HPV18) cell lines in pooled CVM, inoculated onto Teal Wand and then tested with the cobas HPV on the cobas 6800 system. Each sample was tested in a range-finding study consisting of 5-6 concentrations, in replicates of 5 per concentration, to estimate the LoD at the clinical cutoff. The estimated LoD at the clinical cutoff was confirmed by testing 20 replicates, to determine the concentration that has positive test results 95% of the time (at least 19 out of 20 replicates testing positive for each strain).

Table 2. LoD at the Clinical Cutoff of HPV16 & HPV18 in Negative Clinical Vaginal Matrix

HPV type	LoD at the Clinical Cutoff (cells/mL)
SiHa (HPV16)	104
HeLa (HPV18)	54

Additionally, comparison was made to the standard-of-care cervical collection device (Rovers Cervex-brush) on HPV16 and HPV18 cell lines that demonstrated analytical equivalency of the LoD from the Teal sponge and standard-of-care collection device.

7. Inclusivity:
Plasmids for high-risk genotypes 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66 and 68 were tested close to the LoD at the clinical cutoff in the background of pooled HPV negative CVM. All 12 of the high-risk genotypes tested were detected by cobas HPV assay.

B Comparison Studies:

1. Method Comparison:

Not applicable.

2. Matrix Comparison:

Not applicable.

C Clinical Studies:

A clinical study was performed, enrolling individuals 25 to 65 years of age with a cervix, to compare the Teal Wand collected vaginal specimens with paired clinician-collected cervical specimens (an approved specimen type for the cobas HPV assay). Six hundred and nine (609) participants were enrolled at 16 enrollment sites distributed across 14 US states between November 20, 2023, and April 5, 2024, of which 348 were from individuals referred for colposcopy (enriched cohort), and the remaining 234 were enrolled from the general screening population (screening cohort).

Each participant self-collected a vaginal specimen using the Teal Wand following the provided Instructions for Use. Participants then detached the sponge and transferred it to an empty vial. Self-collection occurred in either an exam room or restroom, depending on the clinic. The vial with sponge was then collected by the staff. Following self-collection, each participant filled out usability surveys. Afterwards, a clinician collected a cervical specimen from the same participant using Rovers Cervex-Brush and placed it in 20 mL PreservCyt. Vaginal and cervical specimens were then shipped to designated laboratories. Upon arrival in the laboratory, the self-collected dry vaginal specimens were eluted in 20 mL of PreservCyt and vortexed for five seconds. Both vaginal and cervical specimens were tested per cobas HPV (for use on the 8800 System) instructions.

Of the 609 participants, 27 subjects were excluded from data analysis (10 were excluded due to not meeting study inclusion criteria, 14 subjects had an invalid result on the vaginal specimen, and three subjects had an invalid result on the cervical specimen). The rate of invalid results for the self-collected vaginal specimens was 2.3% (14/599). Therefore, the remaining 582 valid paired self-collected and clinician collected specimen results were used for analysis. The results are summarized below.

Table 3. Agreement between vaginal specimens self-collected using Teal Wand and the clinician collected cervical specimens using Rovers Cervex-Brush using cobas HPV assay.

Screening & Enriched population Combined		Clinician-Collected Cervical Sample (Rovers Cervex-Brush)			
		HPV16 or 18	HR HPV "12 Other"	HR HPV Negative	Total
Self-Collected Vaginal Sample (Teal Wand)	HPV16 or 18	69	0	6	75
	HR HPV "12 Other"	2	207	23	232
	HR HPV Negative	1	13	261	275
	Total	72	220	290	582
14 HR HPV PPA = 95.2% (278/292) (95% CI: 92.1% - 97.1%) HPV 16/18 PPA = 95.8% (69/72) (95% CI: 88.5% - 98.6%) 12 other HR HPV PPA = 94.1% (207/220) (95% CI: 90.2% - 96.5%) NPA = 90.0% (261/290) (95% CI: 86.0% - 92.9%)					

Participants from the enriched cohort had histopathology results available as part of the participant's standard of care. Using these results, the ratio of the sensitivities between vaginal specimens self-collected using Teal Wand and the clinician collected cervical specimens using Rovers Cervex-Brush, both tested on cobas HPV assay for CIN3, was 0.97 (95% CI: 0.90-1.03). The ratio of the sensitivities between vaginal specimens self-collected using Teal Wand and the clinician collected cervical specimens using Rovers Cervex-Brush, both tested on cobas HPV assay for ≥CIN2, was 1.0 (95% CI: 0.94-1.06). The ratio of the specificities between vaginal specimens self-collected using Teal Wand and the clinician collected cervical specimens using Rovers Cervex-Brush, both tested on cobas HPV assay for ≤CIN1, was 0.97 (95% CI: 0.81-1.12). The ratio of the false positive rates between vaginal specimens self-collected using Teal Wand and the clinician collected cervical specimens using Rovers Cervex-Brush, both tested on cobas HPV assay for ≤CIN1, was 1.01(95% CI: 0.95-1.08).

Age Distribution of Study Participants:
Study participants with different education levels ranging from no formal schooling to Master's/professional degree were enrolled in the clinical study and their age distribution is summarized below.

Table 4. Distribution of Study Participants by Age

Age category	**Group 1 (Screening)**	**Group 2 (Enriched)**	**Combined**
25-29	25.2% (59/234)	24.1% (84/348)	24.6% (143/582)
30-39	42.3% (99/234)	44.8% (156/348)	43.8% (255/582)

40-49	21.4% (50/234)	17.5% (61/348)	19.1% (111/582)
50+	11.1% (26/234)	13.5% (47/348)	12.5% (73/582)
Total	234	348	582

D Clinical Cut-Off:
Not Applicable.

E Expected Values/Reference Range:
Not Applicable.

F Other Supportive Performance Characteristics Data:

Usability and User Comprehension
Device usability/user comprehension was assessed in female participants ages 25 to 65 years old. The enrolled subjects represented a range of education levels. The first study involved 601 participants from the clinical study who performed the Teal Wand collection steps, from self-collection of the vaginal specimen to placement of the sponge containing the vaginal specimen into an empty vial. Usability study results demonstrated high user comprehension and ability to execute procedural steps across study participants. All adverse events within the study follow up timeframe, regardless of relatedness to the study device or study collections (self or clinician) were collected and recorded. Overall, most adverse events were attributed to subsequent non-study procedures such as biopsy, Loop Electrosurgical Excision Procedure (LEEP), or other interventions in the enriched enrollment group. Two events were found to be probably or causally related to the Teal Wand.

A second usability study was conducted with 56 participants in simulated home environment across three US sites to evaluate user's ability to follow instructions to unbox the contents of the Teal Wand box and use the shipping materials to prepare the vaginal specimens for mailing to the laboratory. Participants demonstrated success in completing the additional at-home use tasks.

Hazard Analysis and Mitigations
A comprehensive hazard analysis of the Teal Wand was conducted in accordance with ISO 14971:2019, to identify known and foreseeable hazards and hazardous situations and ensure that their risks are appropriately assessed and controlled when used under the conditions of intended use. Specific risks associated with human factors, sample and device handling, storage, and environmental factors were evaluated. Risk control measures have been implemented to reduce the risks.

Tests Evaluating Teal Wand Robustness
The Teal Wand underwent extensive mechanical and bench testing to ensure that it can withstand the intended use at home/similar environment and the specimen can be mailed to the lab. The following elements of the Teal Wand met clinically relevant specifications:

- The force to break the Teal Wand,
- Sheath (insertion shaft) pull off force from the handle,
- The rotor/dial pull out force,

- Petal (distal tip) pull off force,
- Petal (distal tip) spread width,
- Force to deploy the sponge using the dial,
- Torque to rotate the dial,
- Force to retract the dial,
- Sponge deflection under load,
- The force required to pull off the collection sponge,
- The force required to shear the foam sponge from the plastic post,
- Device tumble and drop testing, and
- Teal Wand package testing.

The study data demonstrate that the Teal Wand is robust for its intended use.

Frequently Asked Questions

A Frequently Asked Questions (FAQ) section was created to provide users information to adequately understand the safety, benefits, and precautions of self-collection using the Teal Wand, as well as where users can access additional information regarding HPV and cervical cancer.

Biocompatibility

Biocompatibility safety testing (cytotoxicity, skin sensitization, vaginal irritation, and ethylene oxide sterilization residual) was conducted with the Teal Wand and yielded acceptable results.

VII Proposed Labeling:

The labeling supports the decision to grant the De Novo request for this device.

VIII Identified Risks and Mitigations:

Risks to Health	Mitigation Measures
Failure to collect and transport specimen	Certain design verification and validation Certain labeling information including limiting statements
Insufficient specimen quantity and quality	Certain design verification and validation Certain labeling information including limiting statements
Injury to lay users	Certain design verification and validation

IX Benefit/Risk Assessment:

A Summary of the Assessment of Benefit:

The benefit of the Teal Wand is that individuals can self-collect vaginal specimens for the detection of clinically significant infection with high-risk (HR) HPV genotypes that puts them at risk for the development of cervical pre-cancer or cancer. Self-collection can provide greater patient convenience and comfort, as described by participants in the clinical study who completed a preferences survey. In addition, individuals who may be resistant to pelvic examination by clinician due to history of previous trauma, anxiety or other factors will likely be able to use this self-collection device to obtain a specimen for HPV testing. Up to 25% of individuals in the US do not receive routine cervical cancer screening. Use of this device to

collect specimens at home and transport to clinical laboratory for testing allows for greater access to testing because patients do not have to schedule an appointment or travel to a healthcare setting to provide the specimen needed for testing for high-risk HPV infection. The clinical study showed that self-collected vaginal specimens obtained using the Teal Wand had high positive percent agreement (PPA), compared to clinician collected cervical specimens, for detection of all 14 HR HPV as well as separately for HPV 16/18 and 12 other HR HPV genotypes. The performance was acceptable in both the general screening and enriched cohorts when evaluated separately. In addition, the ratios of clinical sensitivity and specificity for vaginal specimens collected using the Teal Wand compared to clinician collected cervical specimens demonstrated comparable performance between the two types of specimens when tested using the cobas HPV assay.

B Summary of the Assessment of Risk:

The risks associated with the Teal Wand, when used as intended, are those related to failure to collect and transport specimen; insufficient specimen quantity and quality; and injury risk to lay users.

This device is intended for use by lay users. It requires lay users to operate the device independently by following the instructions for use. Failure to operate the device correctly could lead to failure to properly collect and transport the specimen, which could lead to invalid test results, false test results and/or delays in testing and follow-up management. Insertion of a collection device into the vagina to collect vaginal specimens, even if done properly, could be associated with risk of injury to self, including vaginal bleeding and pain.

Insufficient specimen quantity and quality could lead to false test results including false negative and false positive results. Risks of a false positive test include improper patient management, including further evaluation with colposcopy, an invasive procedure associated with patient discomfort, bleeding, pain, and inconvenience. Risks of a false negative test include improper patient management, including missing the opportunity to detect precancerous or early cancerous lesions and treat them before progression.

C Summary of the Assessment of Benefit-Risk:

Although this collection device is anticipated to increase access to cervical cancer testing by offering greater patient convenience and minimize discomfort associated with specimen collection, there are risks associated with the collection kit, including failure to collect and transport specimen, insufficient specimen quality and quantity, and the risk of injury to lay users. These risks need to be mitigated through special controls, including design verification and validation and labeling. In addition, given the need for healthcare involvement based on test results performed using the specimens collected with the Teal Wand, this device should be for prescription use only.

Requiring the performance of usability/user comprehension studies and clinical studies as required by the special controls will help ensure that lay users are able to correctly operate the device and obtain valid test results when used on the cobas HPV assay. The risks associated with insufficient specimen quality and quantity, which can lead to false test results, can also be mitigated by clinical studies, which should demonstrate that the device can collect specimens with comparable performance on the relevant assay as specimens obtained using standard of care collection methods. Clear labeling with simple to follow instructions and warnings or limitations

when the device should not be used, as specified in the special controls, can also help mitigate the risks of failure to properly collect and transport the specimens and for insufficient quantity and quality. Provision of educational information to lay users on expectant risks to self and management strategies can mitigate risk of injury to lay users. Therefore, while general controls are insufficient to mitigate the risks, in light of the special controls, the benefits outweigh the risks for this device.

X Conclusion:

The De Novo request is granted, and the device is classified under the following and subject to the special controls identified in the letter granting the De Novo request:

Product Code(s): SEP
Device Type: Device for home collection and transportation of clinical specimens by lay users for infectious disease testing.
Class: II
Regulation: 21 CFR 866.2920