

COVID-19 specimen collection guidelines for test code 39448

Quest specimen requirements and acceptable supplies for SARS-CoV-2 RNA (COVID-19), Qualitative NAAT (test code 39448)

Note: *Specimen collection guidelines for respiratory testing panels that include SARS-CoV-2 (COVID-19), Influenza A/B, and other respiratory infections (test codes 31686, 31687, 31688) are available as a separate document*

Though Quest does not manufacture the collection supplies for SARS-CoV-2 (COVID-19) molecular testing, we do distribute kits comprised of commercially manufactured supplies for sample collection from nasopharyngeal (NP), oropharyngeal (OP), and anterior nares (AN) anatomic sites. Please call your local order entry team for more information. You do not have to use supplies from Quest to send us samples for testing. Please refer to the information below and to the Quest Test Directory at TestDirectory.QuestDiagnostics.com for a list of acceptable specimen collection and transport supplies for COVID-19 testing.

The tests performed under this test code are being offered under an Emergency Use Authorization (EUA) by the FDA. The EUA stipulates the tests may be used only by Quest laboratories and only for the detection of nucleic acid from SARS-CoV-2, not for any other viruses or pathogens. The authorization is valid only for the duration of the declaration that circumstances exist justifying the EUA for in vitro diagnostic tests for the detection and/or diagnosis of COVID-19 under Section 564(b)(1) of the Act 21, U.S.C. § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner.

Important: *Due to revised guidance on transport media and in accordance with CAP/CLIA guidance, only media listed as acceptable in this guide will be accepted across the entire Quest Diagnostics enterprise. While we understand the significant nationwide supply chain challenges for SARS-CoV-2 molecular testing, adherence to the information in this specimen collection guide will be strictly enforced. It is incumbent on Quest, as a national reference lab, to uphold the highest standards of specimen collection, transport, and testing by adhering to CLIA validation and other regulatory agency validation requirements.*

This guide is intended to describe the collection swabs and media to be used for upper respiratory specimens for SARS-CoV-2 (COVID-19) molecular (NAAT) testing.

Swab sample collections

- It is important that the swab be appropriate for the anatomic site on which it is used, and that the swab type is compatible with that platform
- Flocked swabs are preferred
- Cotton swabs or swabs appearing similar to Q-tips are not acceptable
- Swab submissions in glass transport tubes are not acceptable
- Use only sterile Dacron®, polyester, nylon, or rayon swabs with plastic shafts. Wired shaft swabs are acceptable but must be trimmed using sterile scissors
- 3D-printed swabs are not acceptable
- Note the stem/shaft must be flexible and long enough to collect the NP sample
- If the applicator handle requires additional trimming, it is also important to perform the trimming with a sterile pair of scissors to prevent contamination of the sample
- Calcium alginate swabs or swabs with wooden shafts are unacceptable as they may contain substances that inactivate some viruses and inhibit PCR testing (see <https://www.cdc.gov/coronavirus/2019-ncov/lab/guidelines-clinical-specimens.html>)

The following specimen types are acceptable:

Collected by a healthcare professional (HCP):

- Nasopharyngeal (NP)
- Oropharyngeal (OP)

HCP-observed self-collection or HCP collected:

- Mid-turbinate (MT)
- Anterior nares (AN)

Note: The IDSA panel suggests collecting nasopharyngeal, or mid-turbinate, or nasal swabs rather than oropharyngeal swabs or saliva alone for SARS-CoV-2 RNA testing (<https://www.idsociety.org/practice-guideline/covid-19-guideline-diagnostics/>)

The current body of research shows mid-turbinate and anterior nares samples show greater sensitivity than oropharyngeal samples.^{1,2} Multiple specimens from the same patient may be taken with a single swab. If a separate swab is used for collecting specimens from two different locations in the same patient, both swabs may be placed in the same vial in order to conserve collection and assay supplies.

Other swab specimens, such as tongue or saliva, have decreased sensitivity and are unacceptable.³ More data are necessary to better understand the validity of buccal swabs, saliva, specimens, or other specimen types for COVID-19 testing.

Information on samples from anterior nares:

Anterior nares specimen collection instructions: Use a single swab for collecting specimens from both nares. Position head slightly back, and insert the swab into the LEFT nostril, about one inch. Rotate the swab in a circular motion around the entire inside edge of the nostril. Do this 2 times and then keep it in place for 15 seconds. Repeat the same process in the RIGHT nostril using the same swab. Remove swab and insert the swab into an acceptable viral transport medium (including saline or PBS).

Acceptable swabs: Puritan® 6" Sterile Standard Foam Swab w/ Polystyrene Handle (SKU # 25-1506 1PF) and Copan® Foam swab single wrapped (1C055S01). *Note: Other acceptable swabs include standard OP synthetic swabs w/ plastic/scored shaft.*

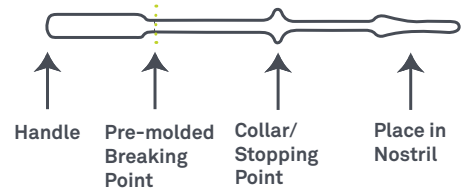


Information on mid-turbinate specimen:

Mid-turbinate specimen: Collected by a healthcare professional or a patient self-collected sample is acceptable when the patient is in an appropriate clinical setting (such as a drive-thru testing site) and the collection is observed by the HCP.

Collection instructions: Use a collar/stopping point swab for collecting specimens from both nares of a symptomatic patient. Tilt patient head and insert swab into 1 nostril until the swab collar touches the outside of the nose. Once the swab is in place, rotate it in a circular motion 2 times and keep it in place for 15 seconds. Repeat this step for the second nostril using the same swab.

Remove the swab and insert the swab into an acceptable viral transport listed in this guide (including saline and PBS). Break the swab shaft against the side of the tube and close the lid.



Acceptable swabs: Contoured Adult Flocked Swab w/Stopper with 80 mm Breakpoint Copan® FLOQSwab (56380CS01) and MDL® NasoSwab™ A362CS02

Specimen stability is as follows:

- Room temperature:** 5 days
- Frozen (-20 °C):** 7 days
- Refrigerated (2 °C–8 °C):** 5 days
- Frozen (-70 °C):** Acceptable

Specimens should be transported to your local Quest Diagnostics laboratory according to standard operating procedures. Cold packs/pouches should be used if placing specimens in a lockbox for courier pickup. STAT pickup cannot be ordered for these tests.

NOTE: FOR TRANSPORT MEDIA, STRICTLY FOLLOW THIS GUIDE.

All swabs must be submitted in liquid transport media, as outlined below.

- Dry swab submissions are unacceptable and will be rejected
- Any swab submitted in media containing guanidinium isothiocyanate, guanidinium thiocyanate, guanidine isothiocyanate, guanidine thiocyanate, or like component is unacceptable and will be rejected
- Any tubes that lack labelling that includes media contents, lot, and expiration date may contain guanidine thiocyanate or a similar chemical; such vials are unacceptable and will be rejected⁴

Viral transport media (VTM)

- 1 mL or 3 mL commercially available vials are acceptable (1 mL of volume may result in a Quantity Not Sufficient (QNS) if repeat testing of a specimen is needed. Therefore, 1 mL vials are not preferred and should only be used when other vials are not available).
- Only 3 mL vials of acceptable VTM may be split into 2 vials (1.5 mL each) using the vial filling process below

Saline or Phosphate Buffered Saline (PBS)

The FDA has indicated saline and PBS as acceptable transport media in situations where commercial viral transport media are unavailable for molecular RT-PCR SARS-CoV-2 assays (such as those in use for the Quest tests). *Note, the FDA believes that for saline, a sterile plastic vial containing between 1 mL and 3 mL of phosphate buffered saline (PBS) 1X pH 7.4 (range of pH 7.2-7.4) or saline (0.85% to 0.90%) is appropriate (1 mL of volume may result in a Quantity Not Sufficient (QNS) if repeat testing of a specimen is needed. Therefore, 1 mL vials are not preferred and should only be used when other vials are not available). Collection should be conducted with a sterile swab.*

- Quest Diagnostics will accept commercially available, FDA-registered prefilled saline or PBS vials. In addition, for clients able to fill vials (using sterile laminar flow hood or a biological safety hood), Quest will accept 2 mL to 3 mL sterile PBS or sterile saline (0.85% or 0.9%) provided the vial filling process below is followed

Vial filling process:

- *Note: Add the VTM, PBS, or saline in the sterile container before collecting the patient sample*
- Acceptable commercially available media, saline or PBS listed as “acceptable” in the following pages of this guide may be portioned into vials using the CDC vial filling process outlined as follows⁵:
 - Lot #, expiration date, and manufacturer (for commercially available VTM, PBS, or saline)
 - The date of manufacture, and expiration date, if known (for client-created VTM)
- Use a sterile environment (eg, a laminar flow hood or biological safety hood) and add the appropriate volume of liquid to the sterile vial
- Use 1.5 mL when splitting a 3 mL VTM tube (the mixing beads at the bottom of viral medium do not need to be transferred) or 2 mL to 3 mL of saline
- Secure the lid of the tube until fully closed to prevent leakage Liquid Amies - Specimens can be stored in liquid Amies media for up to 72 hours at 4 °C



**Sterile plastic tube size—16 mm x 100 mm
(NO GLASS TUBES OR SNAP CAP TUBES)**

Acceptable SARS-CoV-2 (COVID-19) molecular (NAAT) specimen transport media/swabs/kits for test code 39448

Quest Phosphate Buffered Saline (PBS) NP and AN Swab
Convenience kits for collecting and transporting upper respiratory specimens

NP kit ordering information:
PeopleSoft item #: 207128
PeopleSoft product ID: K162
Kit, PBS, Quest, 100/CA
Ordered by the EA (each)

AN kit ordering information:
PeopleSoft item #: 207621
PeopleSoft product ID: K165 KIT,
ANTERIOR, NARES, PBS, 4PK
Ordered by the EA (each) in multiples of 4 only. For example, ordering 8 EA results in 2 kits of 4.



Acceptable SARS-CoV-2 (COVID-19) molecular (NAAT) specimen transport media/swabs//kits for test code 39448

VCM (Diagnostic Hybrids)⁶

NP kit ordering information:

- PeopleSoft item #: 142059
- PeopleSoft product ID #: S05
- Quanum product ID #: S05
- Ordered by the EA (each)

Lesion swab kit ordering information (acceptable for OP):

- PeopleSoft item #: 142060
- PeopleSoft product ID #: S03
- Quanum product ID #: S03
- Ordered by the EA (each)

Note: both swabs in supply kit S03 are the same; only one is necessary for specimen collection.



Not supplied by Quest but acceptable media kits for SARS-CoV-2 (COVID-19) molecular (NAAT) testing

UTM (Copan)⁷

Combo collection kit NP, OP/AN
321 C

NP Collection Kit-305C

OP/AN Collection Kit-306C

UTM medium 3 mL-330C or 3U044n

NP flocked swab-503CS501

OP/AN flocked swab-519CS501



or



UVT (BD)⁸

Combo collection kit nasopharyngeal
and oropharyngeal 3 mL-220527

NP Collection Kit-220529

OP/AN Collection Kit-220528

UTM medium 3 mL-220220 (1 mL*-220244)

NP flocked swab-220252

OP/AN flocked swab-220250



Not supplied by Quest but acceptable media kits for SARS-CoV-2 (COVID-19) molecular (NAAT) testing

Cepheid® Xpert® Sample Collection Kit for Viruses⁹

B-100 NP (new M-100 kit is equivalent)
F-100 OP/AN



B-100 for NP



F-100 for OP/AN

Hardy Diagnostics Healthlink UTM¹⁰

Hardy: 3C036NHL 3 mL: NP
Hardy: 3C037NHL 3 mL: NP
Hardy: 3C040NHL 1 mL*: NP
Hardy: 3C038NHL 3 mL: OP/AN
Hardy: 3C011NHL 1 mL*: OP/AN

Hardy: 330CHL: 3 mL UTM
Hardy: 3C039NHL 3 mL (NP and OP/AN)
Hardy: 302CHL 3 mL (2 OP/AN with plastic applicator)



Hardy: 3C036NHL: NP



Hardy: 3C038NHL: OP/AN

Puritan® UniTranz-RT Universal Transport Medium (UTM) with no swabs¹¹

1 mL* (UT 100); 3 mL (UT-300)

Puritan® UniTranz-RT UTM with flocked swabs for NP (1 mL)*¹¹

Minitip (UT-116)
Ultrafine flocked swabs (UT-117)
Elongated swab (UT-367)

Puritan® UniTranz-RT UTM with flocked swabs for NP (3 mL)¹¹

Ultrafine flocked swabs (UT-317)
Mini-tip Flock Swab (UT-316)

Puritan® UniTranz-RT UTM with flocked swabs for OP/AN¹¹

Large flocked swab 1 mL* (UT-106)
Elongated flocked swab 3 mL (UT-306)

Puritan® UniTranz-RT UTM with Polyester swabs for OP/AN (3 mL)¹¹

One swab (UT-361)
Two swabs (UT-362)
NP and OP/AN both 1 minitip and 1 standard (UT-366 and UT-302)



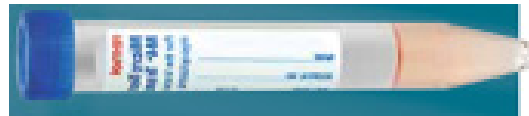
*1 mL of volume may result in a Quantity Not Sufficient (QNS) if repeat testing of a specimen is needed. Therefore, 1 mL vials are not preferred and should only be used when other vials are not available.

Not supplied by Quest but acceptable media kits for SARS-CoV-2 (COVID-19) molecular (NAAT) testing

Starplex™ Scientific Multitrans™ with flocked swabs from Fisher Scientific¹²
 NP flocked: 23-038-096
 NP and OP/AN flocked swab: 22-046-450



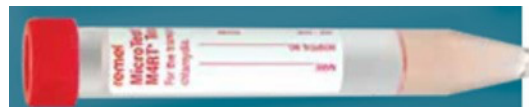
M4 (Fisher/Remel)¹³
 Contains vancomycin, amphotericin B, and colistin and is suitable for transport of viruses, Chlamydiae, Mycoplasma and Ureaplasma)



M4-RT (Fisher/Remel)¹³
 Contains vancomycin, amphotericin B, and colistin and is suitable for transport of viruses, Chlamydiae, Mycoplasma and Ureaplasma)



M6 (Fisher/Remel)¹³
 Contains gelatin, vancomycin, amphotericin B, and colistin for the transport of viruses, Chlamydiae, Ureaplasmas, and Mycoplasmas







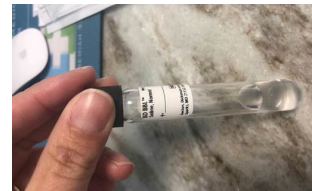
Copan ESwab™¹⁴
 Flocked swab with 1 mL* of liquid Amies in a plastic, screw-cap tube
 White cap (OP/AN flocked swab): Cat#480C or 4C012S.A
 Green cap (minitip flocked swab for NP): Cat#481C
 Blue cap (wire shaft/flexible minitip for NP): Cat#482C



White-OP/AN
 Green and blue-NP

*1 mL of volume may result in a Quantity Not Sufficient (QNS) if repeat testing of a specimen is needed. Therefore, 1 mL vials are not preferred and should only be used when other vials are not available.

Not supplied by Quest but acceptable media kits for SARS-CoV-2 (COVID-19) molecular (NAAT) testing

<p>BD ESwab™¹⁵ 1 mL* of modified liquid Amies medium packaged with a nylon flocked swab</p> <p>The system is available in 3 flocked swab formats: regular (white), minitip (green) and flexible minitip (blue)</p> <p>White (reg flocked swab) OP/AN: Cat#220245 Green (minitip flocked swab) NP: Cat#220246 Blue (flexible minitip) NP: Cat#220532</p>	 <p style="text-align: right;">White-OP/AN Green and blue-NP</p>
<p>Puritan® Opti-Swab™ 1 mL* Liquid Amies Transport Medium w/ 6" elongated flock swab¹⁶ Item # LA-106 for OP/AN swab</p>	 <p style="text-align: right;">Green-NP</p>
<p>Puritan® Opti-Swab™ 1 mL* Liquid Amies Transport Medium w/ 6" minitip flock swab¹⁷ Item # LA-116 for NP swab</p>	 <p style="text-align: right;">Blue-NP</p>
<p>Puritan® Opti-Swab™ 1 mL* Liquid Amies Transport Medium w/ 6" ultrafine flock swab¹⁸ Item #LA-117 for NP swab</p>	 <p style="text-align: right;">White-OP/AN</p>
<p>BD/BBL 0.85% Normal Saline¹⁹</p>	

*1 mL of volume may result in a Quantity Not Sufficient (QNS) if repeat testing of a specimen is needed. Therefore, 1 mL vials are not preferred and should only be used when other vials are not available.

Ref: Equivalency–Copan Universal Transport Medium (UTM)

The products described in the accompanying table are *equivalent* products. They are manufactured in identical fashion with all raw materials being utilized in all products being equivalent and at the same ratios.

Specifically, Copan Universal Transport Medium (UTM), BD UVT, Cepheid XPert Sample Collection Kit for Viruses, Hardy-HealthLink UTM and Quest VCM transports are equivalent products.

Copan	Type	Description	Quest	Cepheid	Hardy/Healthlink	BD	DHI/Quidel	Fisher Healthcare
305C	Sample collection kit (nasopharyngeal)	Nasopharyngeal collection kit: flexible minitip flocked swab + 3 mL UTM® tube	S05	SWAB/B-100	3C036NHL	220526 /220531	403C	230001720
306C	Sample collection kit (OP/AN)	Oropharyngeal collection kit: regular flocked swab + 3 mL UTM® tube	S03	SWAB/F-100	3C038NHL	220528	402C	23001722
330C	Collection kit component	3 mL UTM® medium in 16x100 mm tube	NA	NA	330CHL	UVT 220244 /220220	330C.DHI	23001718
503CS01	Collection kit component	Flexible minitip (nasopharyngeal) flocked swab	NA	NA	NA	220252	503CS01.DHI	23600952
519CS01	Collection kit component	Regular (oropharyngeal) flocked swab	NA	NA	NA	220250	NA	23600957
321C	Combo collection kit (NP and OP/AN)	Flexible minitip flocked swab + regular flocked swab + 3 mL UTM® tube	NA	NA	3C039NHL	220527	99-08021	NA

Important: This list is not inclusive of all unacceptable specimens, and continues to evolve as new unvalidated media continue to enter the market.

UNACCEPTABLE specimens for test code 39448

Calcium alginate swabs, wooden shafted swabs, charcoal medium, anaerobic swab/transport medium

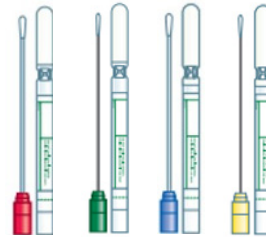
Swab in Amies liquid transport

Amies in swabs is generally in a sponge so there is no fluid to test for COVID-19

Single or double swab (red cap)
Twisted wire shaft swab (green cap)

Swab in Amies gel transport

Gel is not acceptable for PCR
Single or double swab (blue cap)
Twisted wire shaft swab (yellow cap)



BD EZ Swab (single swab)²⁰

Product code 220093



Available with liquid Stuart or liquid Amies media in more than 15 swab and shaft configurations, BD CultureSwab products are designed to meet a wide range of transport needs¹⁷

BD EZ Swab (double swab)²¹





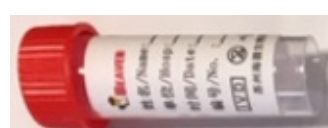



Product code 220105

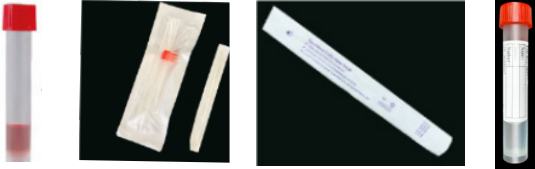




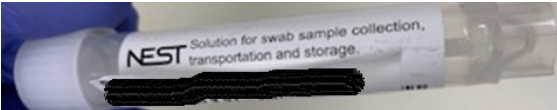







BD BBL™ CultureSwab™ EZ II collection and transport systems are simple-to-use, media-free systems that contain a patented polyurethane foam swab

UNACCEPTABLE specimens for test code 39448, continued

Calcium alginate swabs, wooden shafted swabs, charcoal medium, anaerobic swab/transport medium

<p>BD MaxV²² Product code 220235 (single swab, gel/no charcoal) Product code 220236 (double swab, Amies gel/no charcoal) Product code 220122 (dbl swab, Amies gel w/ charcoal)</p>	 <p>The BD CultureSwab MaxV system is available with liquid Stuart or liquid Amies media, in single- or double-swab formats, for the transport of aerobes. Additionally, the BD CultureSwab MaxV (+) system is available in Amies gel medium without charcoal, in single- and double-swab formats, for the transport of aerobic and facultative anaerobic organisms¹⁹</p>
<p>BBL BD CultureSwab™ –Liquid Stuart (minitip swab-green cap)²³ Product code 220133</p>	
<p>BD ProbeTec™ transport vials²⁴</p>	
<p>Quidel urethral swab PeopleSoft #: 142058 PeopleSoft product ID #: S09 Qanum product ID #: S09 Mfg Part #: #99-08014-VCM</p>	
<p>Beaver</p>	
<p>PrimeStore-MTM²⁵</p>	
<p>Inveox transport media²⁶</p>	
<p>DNA/RNA Shield™²⁷</p>	

UNACCEPTABLE specimens for test code 39448, continued	
Calcium alginate swabs, wooden shafted swabs, charcoal medium, anaerobic swab/transport medium	
<p>Ruhof kits²⁸ Clear and pink/red media</p>	
<p>Abbott Multi-Collect²⁹</p>	
<p>Babio VTM</p>	
<p>MANTACC UTM³⁰</p>	
<p>BIOER Technology RNAsafeguard Reagent/SARS-CoV-2 collection kit</p>	
<p>NEST- ITM (inactivating transport medium)³¹</p>	
<p>Improviral™ NAT VTM³²</p>	
<p>Fillakit1X PBS³³</p>	
<p>Huachenyang iClean VTM kit³⁴</p>	
<p>Lingen Virus Sampling Tube</p>	
<p>No sterile cups or red top vacutainer tubes for upper respiratory swab submissions</p>	

References

1. Tu YP, Jennings R, Hart B et al. Swabs collected by patients or health care workers for SARS-CoV-2 testing. *N Engl J Med*. 2020: NEJMc2016321. Published online June 3, 2020. doi: 10.1056/NEJMc2016321
2. Zou L, Ruan F, and Huang M et al SARS-CoV-2 Viral Load in Upper Respiratory Specimens of Infected Patients. DOI: 10.1056/NEJMc2001737
3. Infectious Disease Society of America website. Accessed May 31, 2020. https://www.idsociety.org/globalassets/idsa/practice-guidelines/covid-19/diagnostics/idsa-covid-19-guideline_dx_version-1.0.1.pdf
4. Lab Alert webpage. Centers for Disease Control and Prevention. Published May 21, 2020. Accessed July 16, 2020. https://www.cdc.gov/csels/dls/locs/2020/mtm_and_cyanide_gas.html
5. PREPARATION OF VIRAL TRANSPORT MEDIUM. Centers for Disease Control and Prevention. Published 2020. Accessed September 28, 2020 <https://www.cdc.gov/coronavirus/2019-ncov/downloads/Viral-Transport-Medium.pdf>
6. Simplify lab-related tasks for better practice workflow. Quest Diagnostics website. Published December 2018. Accessed March 12, 2020. <https://hccpenroll.questdiagnostics.com/wp-content/uploads/2018/12/NEW-Quantum-for-HCP-Website-Brochure.pdf>
7. Copan increases production of UTM COVID-19 sample collection kits. Medical Supply Company Ltd website. Published March 5, 2020. Accessed March 12, 2020. <https://www.medical-supply.ie/2020/03/05/copan-increases-production-of-utm/>
8. Beckton Dickinson website. Accessed March 12, 2020. <https://www.bing.com/images/search?view=detailV2&id=27BCDE77797251CA0BFA2B329E00DDA754FDA75&thid=OIP.4gENK8zrMNV1VlPdJC6gwHaF-&exph=900&expw=1116&q=BD+viral+transport+media&selectedind ex=5&ajaxhist=0&vt=0&sim=11>
9. Cepheid product website. Accessed March 12, 2020. https://www.cephheid.com/?msclkid=e78ea74e94ed19d1538ef924e1b802e7&utm_source=bing&utm_medium=cpc&utm_campaign=USA%7CCepheid%7CBM&utm_term=%2BCepheid&utm_content=Cepheid
10. Universal transport medium. Hardy Diagnostics/Healthlink website. Accessed March 12, 2020. <https://hardydiagnostics.com/industry-content/universal-transport-medium-2/>
11. Puritan UniTranz website. Accessed June 2, 2020. <https://www.puritanmedproducts.com/ut-117.html>
12. Starplex Product Brochure website. Accessed June 3, 2020. http://www.starplexscientific.com/resources/files/Starplex_ProductGuide_Singles.pdf
13. Thermo Scientific Specimen Collection and Transport Solutions—US. Thermofisher catalog website. Published March 2017. Accessed March 12, 2020. [https://assets.thermofisher.com/TFS-Assets/MBD/brochures/Collection-and-Transport-Solutions-Booklet\(US\).pdf](https://assets.thermofisher.com/TFS-Assets/MBD/brochures/Collection-and-Transport-Solutions-Booklet(US).pdf)
14. Copan Diagnostics product insert website. Accessed March 17, 2020. https://www.copanusa.com/wp-content/uploads/2019/07/ESwab-Package-Insert_HPC030_eSwab_copoliestere_Rev00_Date2016.02.pdf
15. Becton Dickinson website. Accessed March 17, 2020. <https://www.bd.com/en-us/offerings/capabilities/specimen-collection/swabbasedspecimen-collection/bd-eswab-collection-and-transport-system>
16. Puritan Opti-Swab website. Accessed March 17, 2020. <https://www.puritanmedproducts.com/diagnostics-specimen-collection/collectiontransport-systems/la-106.html>
17. Puritan Opti-Swab website. Accessed March 17, 2020. <https://www.puritanmedproducts.com/la-116.html>
18. Puritan Opti-Swab website. Accessed March 17, 2020. <https://www.puritanmedproducts.com/la-117.html>
19. BD/BBL 0.85% Normal Saline e-catalogue webpage. Accessed July 16, 2020. <https://www.fishersci.com/shop/products/bd-bbl-prepared-saline-solution-3/B2154399?keyword=BBL+0.85%25+normal+saline+plastic+tube>
20. Becton Dickinson website. Accessed March 17, 2020. <https://www.bd.com/en-us/offerings/capabilities/specimen-collection/swabbasedspecimen-collection/cultureswab-collection-and-transport-systems>
21. Becton Dickinson website. Accessed March 17, 2020. <https://www.bd.com/en-us/offerings/capabilities/specimen-collection/swabbasedspecimen-collection/bd-bbl-cultureswab-ez-collection-and-transport-systems>
22. Becton Dickinson website. Accessed March 17, 2020. <https://www.bd.com/en-us/offerings/capabilities/specimen-collection/swabbasedspecimen-collection/bd-cultureswab-maxv-collection-and-transport-systems>
23. BBL BD culture swab website. Accessed June 1, 2020. <https://www.bing.com/images/search?view=detailV2&ccid=jp9QcOE%2b&id=EC99B0FE81F36D859ADBFC5EA710BF05D931F5B6&thid=OIP.jp9QcOEietXMVhvhVgLQAAAA&mediaurl=https%3a%2f%2fwww.vvr.com%2fstibo%2fbigweb%2fstd.lang.all%2f18%2f89%2f4671889.jpg&exph=246&expw=300&q=BBL+BD+Product+code+220133&simid=608052345339970894&selectedIndex=1&ajaxhist=0>
24. BD Probetec online image. Accessed June 1, 2020. <https://www.fishersci.com/shop/products/bd-probetec-et-ct-gc-collection-kitendocervicalspecimens-et-ct-gc-collection-kit-endocervical-specimens/22370159>
25. PrimeStore Molecular Transport Medium website. Accessed June 1, 2020. <http://www.primestoremTM.com/>
26. Inveox transport medium website. Accessed June 1, 2020. <https://www.bing.com/images/search?view=detailV2&ccid=PqlqV0hG&id=EECC1F84201DE127A6DAFBC4A96ACD9EF8D7BA90&thid=OIP.PqlqV0hGNlrj7fKSwKkt0AAAA&mediaurl=https%3a%2f%2fwww.hensomed.com%2fwp-content%2fuploads%2fsites%2f176%2f2020%2f03%2fCoronavirus-Universal-Viral-Transport-Sample-Collection-Kit-with-Nasal-Swab-50x350.jpg&exph=350&expw=350&q=Beaver+C OVID-19+collection+kit&simid=608044670255762663&selectedIndex=30&ajaxhist=0>
27. DNA/RNA shield Zymo Research website. Accessed June 1, 2020. <https://www.zymoresearch.com/collections/dna-rna-shield/products/dnarna-shield-saliva-collection-kit>
28. Ruhof viral transport medium website. Accessed June 1, 2020. www.ruhof.com
29. Abbott Multi Collect website. Accessed June 1, 2020. <https://www.molecular.abbott/int/en/products/infectious-disease/multicollectspecimen-collection-kit>
30. NEST VTM website. Accessed June 18, 2020. https://www.thomassci.com/Laboratory-Supplies/Transport-Medium/_/Nest-Scientific-VTMViral-Transport-Medium-Disposable-Samplers?q=Viral%20Transport%20Medium
31. MANTACC UTM website. Accessed June 2, 2020. <https://www.mantacc.com/intesti/viral-transport-media-in-bulk-1.html>
32. ImproViral NAT VTM website. Accessed June 18, 2020. <https://www.improve-med.com/improvirus>
33. The Trump administration paid millions for test tubes — and got unusable mini soda bottles. ProPublica website. Published June 18, 2020. Accessed July 15, 2020. <https://www.propublica.org/article/the-trump-administration-paid-millions-for-test-tubes-and-got-unusable-minisoda-bottles>
34. Huachenyang iClean VTM kit webpage. Accessed July 20, 2020. <https://hcyusa.com/media/2020/04/HCY-UTM-Kit-Brochure-April-2020-2.pdf>

QuestDiagnostics.com

Quest, Quest Diagnostics, any associated logos, and all associated Quest Diagnostics registered or unregistered trademarks are the property of Quest Diagnostics. All third-party marks—® and ™—are the property of their respective owners. © 2020 Quest Diagnostics Incorporated. All rights reserved. MI9164 10/2020