



آغا خان یونیورسٹی ہسپتال

The Aga Khan University Hospital

## Specimen collection for diagnosis of Varicella Zoster Virus (VZV)

### Transmission:

It is important to know the transmission of VZV to understand the rationale for taking measures to prevent its transmission.

- VZV can be spread from person to person by direct contact.
- Inhalation of small particles from vesicular fluid of skin lesions of acute varicella or herpes zoster that remain suspended in the air, and possibly through infectious respiratory secretions from patients with varicella that also may be suspended in the air.
- Unprotected (e.g., not wearing recommended personal protective equipment) contact with patients with varicella or disseminated herpes zoster, their secretions, or air containing infectious particles is typically considered an exposure to VZV. Exposures in healthcare settings may include unprotected entry into a source patient's room (or shared air space) or touching vesicular fluid from skin lesions without personal protective equipment.

VZV can also spread from a person with active localized herpes zoster to cause varicella in a susceptible person (i.e., who has never had varicella or has not received varicella vaccine). The lesions of localized (or disseminated) herpes zoster are infectious until they dry and crust over; covering the lesions reduces the risk of transmission to others.

### Skin lesions:



**Figure 01: Chickenpox (Varicella).** Chickenpox is seen in an unvaccinated child. Public Health Image Library, Public Domain, Centers for Disease Control and Prevention (<https://www.ncbi.nlm.nih.gov/books/NBK448191/#:~:text=Lesions%20swiftly%20develop%20within%20approximately,within%20%20to%204%20weeks.>)



آغا خان یونیورسٹی ہسپتال

The Aga Khan University Hospital

## Specimen collection for diagnosis of Varicella Zoster Virus (VZV)



**Varicella Rash.** Papules, pustules, and vesicles are seen on the back of a patient with chickenpox.  
(<https://www.ncbi.nlm.nih.gov/books/NBK448191/#:~:text=Lesions%20swiftly%20develop%20within%20approximately,within%202%20to%204%20weeks.>)



Figure03: Varicella (<https://www.cdc.gov/chickenpox/hcp/clinical-signs/index.html>)



**Pediatric patient with varicella zoster infection (chickenpox).**  
(<https://www.infectiousdiseaseadvisor.com/ddi/varicella-zoster-virus/>)



**Adult patient with herpes zoster infection (shingles).** (<https://www.infectiousdiseaseadvisor.com/ddi/varicella-zoster-virus/>)



آغا خان یونیورسٹی ہسپتال

The Aga Khan University Hospital

## Specimen collection for diagnosis of Varicella Zoster Virus (VZV)

---

### **Infection prevention during specimen collection:**

#### **PPE requirement:**

- Always follow standards and contact precautions
- Always wear a properly fitted N95, gloves and gown when evaluating a patient with vesicular or pustular illness that could be smallpox.

#### **Patient room:**

- Patients should be in an airborne precaution room (AIIR room with negative pressure).
- In case AIIR rooms are not available, the patient can be isolated in a temporarily created AIIR using an authorized air purifier device e.g. UVGI, or Portable HEPA filter

### **Specimen collection:**

Sample should be collected from skin lesion material (vesicular fluid, maculopapular lesions, or scabs from lesions).

**Swab type:** Sterile polyester or Dacron swab or nylon swab (NOT cotton swabs).

**Transport medium:** Not required. Specimen is transported as dry swabs in a sterile tube without any transport medium.

**Specimens to be collected:** Swabs of skin lesions (papule, macule, or vesicles)

#### **Specimen collection process:**

1. All specimens collected for laboratory investigations should be regarded as potentially infectious and handled with caution.
2. Collect the required supplies before putting on PPE.
  - a. Sterile Dacron / polyester swabs—2
  - b. Swab collection tube: sterile white top vacutainer tubes—2
  - c. Zip lock bags—1
  - d. Secondary container (large red top jar)—1, for putting swab collection tubes.
  - e. Disinfectant—alcohol wipes.
3. Labelling: label tubes and containers with two patient identifiers before entering patient room. Place biohazard tag on secondary container.
4. Write a laboratory requisition slip with correct patient identifiers and test request and put it in the



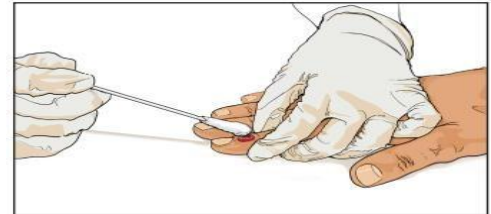
## Specimen collection for diagnosis of Varicella Zoster Virus (VZV)

secondary container.

5. Don PPE.
6. Enter patient's room
7. Explain procedure to patients, or guardian in case of a minor
8. Identify the lesions to be sampled, preferably vesicle or pustule. The lesion could be a macule, papule, vesicle, pustule or scab.
9. Two similar looking lesions should be sampled with one swab, preferably from active lesions from different locations on the body.

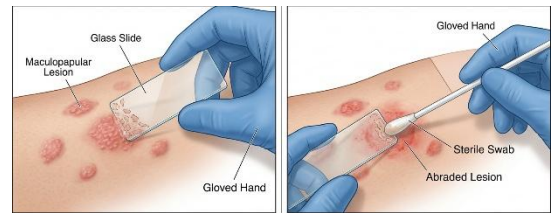
a. Polyester swab: This method is best suited for **sampling vesicular lesions**.

- i. Use a sterile needle to unroof the top of the vesicle.
- ii. Use a sterile swab to vigorously wipe the base of the lesion to collect vesicular fluid. Apply enough pressure to collect epithelial cells without causing bleeding.
  - Important note: Collect infected epithelial cells from the base of the lesion which usually contain virus.
  - Swab type: CDC recommends swabs made with polyester tips and plastic stems. Do not use swabs with wooden stems.
- iii. When multiple swabs from the same patient are collected place each swab in a separate tube to avoid cross-contamination. Label tubes individually and ensure they are resistant to breakage.



b. Glass slide: This method is critical for the collection of material **from maculopapular lesions**.

- i. Rake the edge of the slide over the selected lesion, abrading the lesion with sufficient vigor to ensure that skin cells are gathered onto the slide.
- ii. Use a sterile polyester swab to scrub the abraded lesion and (using the same swab) collect the material collected on the edge of the slide.
  - Important: If more than one lesion is sampled, use a separate swab for each one.
  - With young children: It may be less stressful for them if you ask them to help with this.
- iii. Insert the swab into a tube and close it (many swabs are provided with a tube that includes a label for marking the specimen).
- iv. Ship in a padded envelope. The swab for each sampled lesion must be placed in a separate swab tube, but multiple tubes can be shipped in the same envelope.



i. Rake edge of slide

ii. Scrub and collect with swab



آغا خان یونیورسٹی ہسپتال

The Aga Khan University Hospital

## Specimen collection for diagnosis of Varicella Zoster Virus (VZV)

---

- c. Collecting scabs: Scabs are excellent samples for PCR detection of VZV DNA. Whenever present, lift scabs off the skin (a glass slide can be used for this purpose). Then transfer directly into break-resistant, snap-cap or screw-top tubes.
10. Wipe the outside of the tubes with 70% alcohol wipes and place these in a zip lock bag and close it.
11. Put the zip lock bag in the secondary container that is also labelled with two identifiers of the patient and a biohazard tag.
12. Wipe the outside of the secondary container with 70% alcohol wipes.
13. Doff PPE inside patient's room except the N95 mask as it should be removed after departing that area.
14. Perform hand hygiene and exit the room with sample

**Storage of sample:** Specimens should be stored refrigerated or frozen within an hour of collection and transported to the laboratory as soon as possible.

**Transport:** Transport the specimen to laboratory as soon as possible. Send the specimen to the laboratory in designated box with ice packs.

**Disinfection:** Effective disinfectants include 0.1% solution of hypochlorite (containing approximately 1,000 ppm free chlorine) (freshly made).

**Rejection criteria:** Sample collected with cotton swab is not acceptable. Sample kept at room temperature for longer than 1 hour.

### **Disinfection of room after sample collection:**

**Responsibility:** house-keeping staff

**PPE:** gloves, disposable gown, face mask (surgical) and N95 for Patient rooms.

**Disinfectant:** 0.1% sodium hypochlorite solution

**Directions for cleaning:** change bed cover/sheet. Wipe trolley surface and doorknobs with 0.1% sodium hypochlorite.



آغا خان یونیورسٹی ہسپتال

The Aga Khan University Hospital

## Specimen collection for diagnosis of Varicella Zoster Virus (VZV)

---

### References:

- <https://www.cdc.gov/chickenpox/php/laboratories/collecting-vzv-specimens.html>
- <https://www.cdc.gov/laboratory/specimen-submission/detail.html?CDCTestCode=CDC-10255>
- <https://www.youtube.com/watch?v=W1b66K2Uzfg>
- [https://portal.ct.gov/dph/-/media/departments-and-agencies/dph/dph/infectious\\_diseases/ctepinews/vol22no4pdf.pdf?rev=fdcc7dc3dc0f491a870854e0dea72828&hash=12AB76E580BF7B4A058C71CD86A656CD#:~:text=Staff%20and%20visitors%20should%20wear%20respirators%20\(N95,so%20that%20the%20rash%20is%20fully%20covered.](https://portal.ct.gov/dph/-/media/departments-and-agencies/dph/dph/infectious_diseases/ctepinews/vol22no4pdf.pdf?rev=fdcc7dc3dc0f491a870854e0dea72828&hash=12AB76E580BF7B4A058C71CD86A656CD#:~:text=Staff%20and%20visitors%20should%20wear%20respirators%20(N95,so%20that%20the%20rash%20is%20fully%20covered.)