

## **MPOX FAQ'S FOR CLINICIANS**

### **What is Mpox?**

Mpox is a rare disease caused by infection with the mpox virus. Mpox virus is part of the same family of viruses as smallpox. It is a viral illness that typically can cause flu-like illness and swelling of the lymph nodes and progresses to a rash on the face and body. Most infections last 2-to-4 weeks. It typically takes between 1 and 2 weeks after exposure to exhibit symptoms from the monkeypox virus, but it could take as long as 3 weeks. The virus typically resolves within 2-4 weeks.

### **What are the symptoms of mpox?**

Mpox symptoms are similar to smallpox symptoms, but milder; and mpox is rarely fatal. Mpox is not related to chickenpox. Symptoms of mpox can include fever, headache, muscle aches and backache, swollen lymph nodes, chills, and/or exhaustion.

A rash that can look like pimples or blisters that appears on the face, inside the mouth, and on other parts of the body, like the hands, feet, chest, genitals, or anus. The rash goes through different stages before healing completely. The illness typically lasts 2-4 weeks.

Sometimes, people get a rash first, followed by other symptoms. Others only experience a rash.

### **How is mpox transmitted?**

Mpox is transmitted by symptomatic individuals through close contact with lesions, bodily fluids, or respiratory secretions and objects that have had contact with lesion or bodily fluids (e.g., contaminated linens, bandages, dishes).

### **How can patients minimize risk of transmission?**

Hand hygiene (e.g., use of an alcohol-based hand rub or hand washing with soap and water) should be performed by infected persons and household contacts after touching lesion material, clothing, linens, or environmental surfaces that may have had contact with lesion material.

- Persons with mpox should wear a well-fitting mask or respirator, especially those who have respiratory symptoms (e.g., cough, shortness of breath, sore throat) or significant oral lesions if close contact with others cannot be avoided (e.g., when obtaining medical care). Other household members should wear a well-fitting mask or respirator when in the presence of the person with mpox.
- Changing bandages and handling of contaminated linens should be performed by the person with mpox while wearing disposable gloves. Hand hygiene should be performed immediately following removal of gloves.

- Cover skin lesions to the best extent possible (e.g., long sleeves, long pants). Gloves can be considered for covering lesions on the hands when not in isolation (e.g., emergencies, medical care).
- Contain and dispose of contaminated waste (e.g., dressings, bandages, gloves);

### **What should prompt clinical suspicion for mpox infection?**

Clinicians should be alert to patients presenting with a new characteristic rash or if the patient meets one of the epidemiological criteria and there is a high clinical suspicion for mpox. Especially people reporting travel history to a country where mpox has been identified within a month before illness onset, people reporting contact with people who have a similar rash or have received a diagnosis of suspected or confirmed mpox, or men who report sexual contact with other men and who present with lesions in the genital/perianal area.

- The mpox rash involves vesicles or pustules that are deep-seated, firm or hard, and well-circumscribed. Lesions can occur on the palms and soles or be generalized affecting other areas; they may umbilicate or become confluent and progress over time to scabs. Presenting symptoms typically include fever, chills, the distinctive rash, or new lymphadenopathy; however, onset of perianal or genital lesions in the absence of fever has been reported in the recent cases.
- The rash associated with mpox can be confused with other rashes encountered in clinical practice including herpes, syphilis, and varicella. Patients co-infected with mpox virus and other infectious agents (e.g., varicella zoster, herpes, syphilis) have been reported. Clinicians should therefore have mpox on their differential diagnosis when presented with an associated sexually transmitted infection (STI) or STI-like rash, even if it is localized and not

### **What if my patient was exposed to mpox infection?**

- Clinicians should first consult their local health department as soon as a monkeypox exposure is suspected. A risk assessment will need to be conducted to determine if post-exposure medication or vaccination is recommended. Unique circumstances (e.g., immunocompromised) can be factored into the risk determination, but these decisions should be made on a case-by-case basis.
- Clinicians should advise the patient to isolate at home while diagnosis is being confirmed.
- Patients who have been exposed to monkeypox, even if they do not have symptoms, may be eligible for post-exposure vaccination.
- After exposure, the patient should be educated about the clinical presentations of monkeypox infection and instructed to contact their physician if they exhibit any of these clinical signs and symptoms as soon as possible.

**PUBLIC HEALTH**

Contacts should be instructed to monitor their temperature twice daily. If symptoms develop, contacts should immediately self-isolate and contact the local health department for further guidance.

- If fever or rash develop, contacts should self-isolate and contact their local or state health department immediately.
- If only chills or lymphadenopathy develop, the contact should remain at their residence and self-isolate for 24-hours.
  - During this time, the individual should monitor their temperature for fever; if a fever or rash develop, the health department should be contacted immediately.
  - If fever or rash do not develop and chills or lymphadenopathy persist, the contact should be evaluated by a clinician for potential cause. Clinicians can consult with their local health departments if monkeypox is suspected.

Contacts who remain asymptomatic can be permitted to continue routine daily activities (e.g., go to work, school). Contacts should not donate blood, cells, tissue, breast milk, semen, or organs while they are under symptom surveillance.

- Refrigerate (2–8°C) or freeze (-20°C or lower) specimens within an hour after collection. Refrigerated specimens need to be delivered to ODHL within 6 days from collection and should be shipped with ice packs or dry ice. If using ice packs, the temperature of the sample **must** be between 2–8°C and if shipped with dry ice the temperature of the sample must be -20°C or lower. Due to the warmer temperatures in the summer months, the dry ice method is preferred. ODH has reported have to discard samples that were sent with ice pack because the ice packs were not enough to maintain the necessary temperature.
- Shipping/transportation details will be provided during the CDC/ODH conference call.



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### What should I do if my patient has mpox?

- Clinicians should first isolate their patient in a single person room if available and immediately consult their local health department as soon as mpox is suspected. Prompt notification is important to facilitate testing, exposure risk assessments for close contacts, and, for the patient or close contacts, consideration of available medications and vaccination. Patients with suspected mpox infection should be instructed to isolate themselves and avoid close contact with other people and animals, including pets.

### What is the expected course of illness for my patient?

Monkeypox disease is characterized by an incubation period, prodrome, and rash.

- **Incubation Period:** Infection with monkeypox virus begins with an incubation period where the person does not have symptoms and may feel fine. The incubation period is roughly 1-2 weeks. **A person is not contagious during this period.** Physicians are currently recommended to monitor patients up to 21 days.
- **Prodrome:** People with mpox infection may develop an early set of symptoms (prodrome). These symptoms may include fever, malaise, headache, sore throat, or cough, and (in many cases) swollen lymph nodes. Lymphadenopathy is a characteristic feature of mpox, and lymph nodes may swell in the neck (submandibular & cervical), armpits (axillary), or groin (inguinal) and can occur on both sides of the body or just one. **A person may be contagious during this period.** Instruct patients to isolate if they develop symptoms.
- **Rash:** In some recent mpox cases, people have presented with a rash without a recognized prodrome. Many of the recent cases have only had localized lesions and have not presented with diffuse rash often seen in figures. People with monkeypox infection develop lesions that typically progress from papules, macules, vesicles, pustules, and then scabs. **A**



***person is contagious until after all the scabs on the skin have fallen off and a fresh layer of intact skin has formed underneath.***

### **How long does my patient need to isolate?**

For patients with monkeypox, isolation precautions should be continued until cleared by public health officials after all lesions have resolved, the scabs have fallen off, and a fresh layer of intact skin has formed. The illness typically lasts 2-4 weeks. Decisions regarding discontinuation of isolation precautions at a healthcare facility and at home should be made in consultation with the local or state health department.

Patients should isolate until all lesions have resolved, the scabs have fallen off, and a fresh layer of intact skin has formed.

- People with monkeypox should adhere to these recommendations until cleared by public health:
  - Do not leave the home except as required for emergencies or follow-up medical care.
  - Persons without an essential need to be in the home should not visit.
  - Avoid close contact with others.
  - Avoid close contact with pets in the home.
  - Abstain from all sexual activity.
  - Do not share items that could be contaminated by the lesions (e.g., bed linens, clothing, towels, wash cloths). Do not share drinking glasses or eating utensils.
  - Routinely clean and disinfect commonly touched surfaces and items (e.g., counters, light switches) using an EPA-registered disinfectant in accordance with the manufacturer's instructions.
  - Wear a well-fitting mask or respirator for source control when in close contact with others at home.
  - Avoid use of contact lenses to prevent inadvertent infection of the eye.
  - Avoid shaving areas of the body with lesions as this can lead to spread of the virus.
- Bathroom usage:
  - If possible, use a separate bathroom if there are others who live in the same household.
  - If there is not a separate bathroom in the home, the patient should clean and disinfect surfaces (e.g., counters, toilet seats, faucets) using an EPA-registered household cleaning product after using a shared space if the lesions are exposed (e.g., showering, toileting, changing bandages covering the lesions). Consider disposable glove use while cleaning if lesions are present on the hands.
- Limit exposure to others:
  - Avoid contact with unaffected individuals until lesions have resolved, the scabs have fallen off, and a fresh layer of intact skin has formed.
  - Isolate in a room or area separate from other household members and pets when possible.

- Limit use of spaces, items, and food that are shared with other household members.
  - Do not share dishes and other eating utensils. It is not necessary for the infected person to use separate utensils if properly washed. Wash soiled dishes and eating utensils in a dishwasher or by hand with warm water and soap.
- Limit contamination within household:
  - Avoid direct contact with upholstered furniture and porous materials that cannot be laundered by placing coversheets, waterproof mattress covers, blankets, or tarps over these surfaces. Additional precautions such as steam cleaning can be considered if there is concern about contamination.

### **What medications are used to treat Mpox?**

Currently there is no treatment specifically approved for mpox virus infections. Antivirals developed for use in patients with smallpox may prove beneficial. It is unknown whether a person with severe monkeypox infection will benefit from treatment with either antiviral, although their use may be considered.

#### **Tecovirimat (also known as TPOXX or ST-246)**

- Available from the US Strategic National Stockpile (SNS).
- An antiviral approved by the FDA for the treatment of human smallpox disease in adults and pediatric patients.
- In laboratory tests, tecovirimat has been shown to stop the growth of the virus that causes smallpox and to be effective in treating animals that had diseases similar to smallpox (e.g., monkeypox).
- Studies have shown that tecovirimat administered in healthy people is safe and causes only minor side effects.
- CDC holds an Expanded Access Investigational New Drug Protocol (EA-IND) that allows for the use of tecovirimat for treatment of non-variola orthopoxvirus infections (including mpox) in an outbreak.

#### **Vaccinia Immune Globulin Intravenous (VIGIV)**

- Available from the US Strategic National Stockpile (SNS).
- Licensed by FDA for treatment of complications due to vaccinia vaccination such as progressive vaccinia.
- CDC holds an EA-IND that allows the use of VIGIV for treatment of orthopoxvirus infections (including monkeypox) in an outbreak.

#### **Brincidofovir\* (also known as Tembexa)**

- Not currently available from the US Strategic National Stockpile (SNS).
- Antiviral medication approved by the FDA for the treatment of human smallpox disease in adult and pediatric patients, including neonates.

- In laboratory tests, has been shown to stop the growth of the virus that causes smallpox and to be effective in treating animals that had diseases similar to smallpox (e.g., monkeypox).
- When administered in people who received brincidofovir following bone marrow transplants, the most common side effects were diarrhea, nausea, vomiting, and abdominal pain.
- CDC is currently developing an EA-IND to help facilitate use of brincidofovir as a monkeypox treatment.

**Cidofovir\* (also known as Vistide)**

- An antiviral medication that is approved by the FDA for the treatment of cytomegalovirus (CMV) retinitis in patients with Acquired Immunodeficiency Syndrome (AIDS).
- In laboratory tests, cidofovir has also been shown to stop the growth of the virus that causes smallpox and to be effective in treating animals that had diseases similar to smallpox (e.g., monkeypox).
- This drug continues to be evaluated for effectiveness and toxicity.
- CDC holds an EA-IND that allows for the use of cidofovir for treatment of orthopoxvirus infections (including monkeypox) in an outbreak.
- Brincidofovir may have an improved safety profile over cidofovir. Serious renal toxicity or other adverse events have not been observed during treatment of cytomegalovirus infections with brincidofovir as compared to treatment using cidofovir.

*\* Data is not available on the effectiveness of brincidofovir or cidofovir in treating human cases of monkeypox. Both have proven activity against poxviruses in in vitro and animal studies.*

**Is there a vaccine available and who is eligible to receive it?****JYNNEOS**

- JYNNEOS is licensed by the FDA to prevent mpox and smallpox..
- Because it's made from a non-replicating virus, JYNNEOS may be a better option for people with weakened immune systems, and in those who are pregnant or who have other health conditions.
- JYNNEOS is currently only approved for adults aged 18 and older, but CDC is working with FDA to expand eligibility for persons under age 18 through an Expanded Access Investigational New Drug Protocol (EA-IND) protocol. Providers can also file a single-use IND with FDA for pediatric use on a case-by-case basis.
- Currently, post-exposure vaccination is being offered by public health professionals for individuals exposed to a patient with mpox.
- JYNNEOS is safe to administer to people with weakened immune systems, though they may be less likely to mount an effective response after vaccination.



**ACAM2000**

- ACAM2000 is licensed for immunization in people who are at high risk for smallpox infection. It can be used in people exposed to monkeypox if used under an EA IND.
- ACAM2000 contains live vaccinia virus, not a killed or weakened virus like many other vaccines. For that reason, people who are vaccinated with ACAM2000 must take precautions when caring for the place on their arm where they were vaccinated, so they can prevent the vaccinia virus from spreading.
- For most people with healthy immune systems, live virus vaccines are safe and effective. Sometimes after getting vaccinated with a live virus vaccine, like ACAM2000, people will experience mild symptoms such as rash, fever, and head and body aches.
- Vaccines like ACAM2000 were widely used during the campaign to eradicate smallpox. However, this vaccine has the potential for more serious side effects and adverse events than the newer vaccine, JYNNEOS. People who might be more likely to have these side effects include those with skin problems, including eczema, atopic dermatitis, psoriasis, or uncontrolled acne; a weakened immune system, such as people who have received a transplant, are living with HIV, are receiving treatment for cancer, or are taking medications that suppress the immune system.
- If administered, patients should be counseled that ACAM2000 may cause serious heart problems, including myocarditis and pericarditis. In studies, about 1 in every 175 persons who got the vaccine for the first time may have experienced myocarditis and/or pericarditis. On rare occasions these conditions can result in irregular heartbeat and death. These risks are lower for patients previously vaccinated with ACAM2000. Patients can have myocarditis or pericarditis even without symptoms. Call your healthcare provider or seek emergency help right away if you have: chest pain or pressure, fast or irregular heartbeat, or breathing problems.

JYNNEOS vaccine is being allocated to jurisdictions for use for the following individuals:

- Known contacts who are identified by public health via case investigation, contact tracing, and risk exposure assessments
- Presumed contacts who may meet the following criteria:
  - Know that a sexual partner in the past 14 days was diagnosed with monkeypox
  - Had multiple sexual partners in the past 14 days in a jurisdiction with known monkeypox

JYNNEOS doses should be prioritized for those people who are at risk for severe adverse events with ACAM2000 or severe disease from monkeypox (such as people with HIV or other immunocompromising conditions).

**Can pregnant or breastfeeding patients get vaccinated?**

Clinicians considering vaccinating patients who are pregnant or breastfeeding should consult public health authorities. Because human data is lacking, healthcare providers should discuss the risk and benefits with the patient using shared decision making.



**JYNNEOS**

1. *Pregnant patients:* available human data on JYNNEOS administered to pregnant people are insufficient to determine vaccine-associated risks in pregnancy. Animal models, including rats and rabbits, have shown no evidence of harm to a developing fetus.
2. *Breastfeeding patients:* the safety and efficacy of JYNNEOS has not been evaluated in breastfeeding patients. It is not known whether JYNNEOS is excreted in human milk. Data are not available to assess the impact of JYNNEOS on milk production or the safety of JYNNEOS in breastfed infants. Because JYNNEOS vaccine is replication-deficient, it likely does not present a risk of transmission to breastfed infants and can be administered to patients who are breastfeeding if vaccination is critical.

**ACAM2000**

1. *Pregnant patients:* ACAM2000 has not been studied in pregnant patients. However, fetal vaccinia has been reported in fetuses and newborns of pregnant patients vaccinated with replication-competent smallpox vaccines. Smallpox vaccine may rarely cause infection in an unborn baby if the mother is vaccinated during pregnancy. This infection usually results in stillbirth or death. For this reason, ACAM2000 should not be administered to people who are pregnant or may be pregnant (Pregnancy Category D).
2. *Breastfeeding patients:* ACAM2000 has not been studied in persons who are lactating, so it is unknown whether the vaccine virus or antibodies are secreted in human milk. Live vaccine virus can be inadvertently transmitted from a lactating mother to her infant. Infants are at high risk of developing serious complications from live vaccinia smallpox vaccination.

**With the increase in mpox cases, what should we do to keep our healthcare professionals safe?**

Healthcare providers should continue utilizing full PPE when caring for patients. This includes gloves, gowns, shoe covers, head covers, masks, respirators, eye protection, face shields, and goggles. Other important things include:

- Hand hygiene – the use of an alcohol-based hand rub or hand washing with soap and water – should be performed by people with mpox and household contacts after touching rash material, clothing, linens, or environmental surfaces that may have had contact with rash material.
- If someone has been exposed or has a known or probable case of mpox they should use well-fitting source control (e.g., medical mask) when receiving medical care.
- Contain and dispose of contaminated waste, such as dressings, bandages, or disposable gloves.

## **How do we monitor exposed healthcare professionals?**

Any healthcare worker who has cared for a monkeypox patient should be alert to the development of symptoms that could suggest mpox infection, especially within the 21-day period after the last date of care, and should notify infection control, occupational health, and the health department to be guided about a medical evaluation.

Healthcare workers who have unprotected exposures (i.e., not wearing PPE) to patients with mpox do not need to be excluded from work duty, but should undergo active surveillance for symptoms, which includes measurement of temperature at least twice daily for 21 days following the exposure. Prior to reporting for work each day, the healthcare worker should be interviewed regarding evidence of fever or rash.

Healthcare workers who have cared for or otherwise been in direct or indirect contact with mpox patients while adhering to recommended infection control precautions may undergo self-monitoring or active monitoring as determined by the health department.

CDC does not currently recommend pre-exposure vaccination for most U.S. healthcare workers. Monkeypox primarily spreads through close contact and does not spread as easily as diseases like COVID-19. Proper use of personal protective equipment and infection control practices are effective at reducing the risk of transmission of the monkeypox virus when examining a patient or handling contaminated materials.

The risk of mpox for most front-line healthcare workers is low. Healthcare workers who are exposed to mpox may benefit from post-exposure prophylaxis with the JYNNEOS vaccine. CDC is working closely with partners to ensure there are enough vaccine doses available for those who are JYNNEOS™ (also known as Imvamune or Imvanex) and ACAM2000 are the two currently licensed vaccines in the United States to prevent smallpox. These vaccines are available from the US Strategic National Stockpile (SNS). JYNNEOS is also licensed specifically to prevent monkeypox. Both JYNNEOS and ACAM2000 can be used before and after exposure to monkeypox in an outbreak setting. Historically, those who receive pre-exposure vaccination include laboratorians and other personnel who work with mpox and other orthopoxviruses.

## **What if I diagnose my patient with another infection (e.g., a sexually transmitted infection)? Can I assume that the patient does not have mpox?**

The cases of mpox described in the current outbreak have some atypical features. The rash may start in the genital and perianal areas; the rash may not always disseminate to other parts of the body and typical prodromal symptoms may be mild or absent. These features of the newest mpox cases can easily be confused with STIs. It is important to comprehensively evaluate patients presenting with genital or perianal ulcers for STIs. However, co-infections with mpox and STIs

have been reported and the presence of an STI does not rule out mpox. Patients with a new characteristic rash or who meet one or more of the epidemiologic criteria, and if there is a high suspicion, should be tested for mpox.

### **Do patients need to wear condoms after recovery from mpox?**

Safe sex, barrier practices (i.e., wearing condoms) are recommended, but there is little data to support the length of time patients need to wear condoms. Some other countries are recommending a minimum of 8 weeks, but we are still learning about this virus in the context of transmission through sexual contact. As public health experts learn more about monkeypox transmission this guidance will be updated.

### **Are any people at increased risk for severe mpox disease?**

Young children (<8 years of age), individuals who are pregnant or immunocompromised, and individuals with history of atopic dermatitis or eczema may be at an increased risk for severe outcomes from mpox disease. Living or traveling to endemic countries and male intimate contact with other men of unknown exposure history are also risk factors for acquiring the disease.

### **Should patients be concerned about their pets?**

People with mpox should avoid contact with animals (specifically mammals), including pets. If possible, friends or family members should care for healthy animals until the owner has fully recovered. Keep any potentially infectious bandages, textiles (e.g., clothes, bedding) and other items away from pets, other domestic animals, and wildlife. There is currently no evidence that animals, apart from mammals, can become infected and transmit mpox. If you notice an animal that had contact with an infected person appearing sick (e.g., lethargy, lack of appetite, coughing, bloating, nasal or ocular secretions or crust, fever, pox lesions) contact the owner's veterinarian, state public health veterinarian, or state animal health official.

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## **Case Definitions for Use in the 2022 Monkeypox Response**

### **Suspect Case**

- New characteristic rash\* **OR**
- Meets one of the epidemiologic criteria and has a high clinical suspicion<sup>†</sup> for mpox

### **Probable Case**

- No suspicion of other recent *Orthopoxvirus* exposure (e.g., *Vaccinia virus* in ACAM2000 vaccination) **AND** demonstration of the presence of
  - *Orthopoxvirus* DNA by polymerase chain reaction of a clinical specimen **OR**
  - *Orthopoxvirus* using immunohistochemical or electron microscopy testing methods **OR**

- Demonstration of detectable levels of anti-orthopoxvirus IgM antibody during the period of 4 to 56 days after rash onset

### Confirmed Case

- Demonstration of the presence of *Mpox virus* DNA by polymerase chain reaction testing or Next-Generation sequencing of a clinical specimen **OR** isolation of *Mpox virus* in culture from a clinical specimen

### Epidemiologic Criteria

Within 21 days of illness onset:

- Reports having contact with a person or people with a similar appearing rash or who received a diagnosis of confirmed or probable mpox **OR**
- Had close or intimate in-person contact with individuals in a social network experiencing mpox activity, this includes men who have sex with men who meet partners through an online website, digital application (“app”), or social event (e.g., a bar or party) **OR**
- Traveled outside the US to a country with confirmed cases of mpox or where *Mpox virus* is endemic **OR**
- Had contact with a dead or live wild animal or exotic pet that is an African endemic species or used a product derived from such animals (e.g., game meat, creams, lotions, powders, etc.)

### Exclusion Criteria

A case may be excluded as a suspect, probable, or confirmed case if:

- An alternative diagnosis\* can fully explain the illness **OR**
- An individual with symptoms consistent with mpox does not develop a rash within 5 days of illness onset **OR**
- A case where high-quality specimens do not demonstrate the presence of *Orthopoxvirus* or *Mpox virus* or antibodies to orthopoxvirus

*\*Clinical suspicion may exist if presentation is consistent with illnesses confused with monkeypox (e.g., secondary syphilis, herpes, and varicella zoster).*

\*The characteristic rash associated with mpox lesions involve the following: deep-seated and well-circumscribed lesions, often with central umbilication; and lesion progression through specific sequential stages—macules, papules, vesicles, pustules, and scabs.; this can sometimes be confused with other diseases that are more commonly encountered in clinical practice (e.g., secondary syphilis, herpes, and varicella zoster). Historically, sporadic accounts of patients co-infected with *Mpox virus* and other infectious agents (e.g., varicella zoster, syphilis) have been reported, so patients with a characteristic rash should be considered for testing, even if other tests are positive. Categorization may change as the investigation continues (e.g., a patient may go from suspect to probable).

**The CDC can assist physicians in the diagnosis and management of patients with suspected mpox. If VIGIV or antivirals are needed, or additional information is required, physicians should contact the CDC Emergency Operations Center at 770-488-7100, Monday through Friday 8 AM to 4:30 PM Eastern Standard Time; at other times call (404) 639-2888.**



Below are examples of the monkeypox rash from the CDC:

## MPOX

### VISUAL EXAMPLES OF MONKEYPOX RASH





Photo Credit: NHS England High Consequence Infectious Diseases Network



CS328947-EK

## MPOX

### VISUAL EXAMPLES OF MONKEYPOX RASH





Photo Credit: UK Health Security Agency



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