Training on Pfizer-BioNTech COVID-19 mRNA Vaccine COMIRNATY® (Tozinameran)

First publication date: 27 January 2021

First update: 8 August 2021

Updated: 05 October 2021

Contents

01 October 2021 update includes the following:

- UCC strategy and alternative storage conditions at -20 °C and +2 to +8 °C;
- Recommended age for vaccine administration;
- Application of dynamic labeling;
- Information on extended shelf life for frozen unopen vials and undiluted thawed vaccine vials; and
- Specification of alternative syringe choices, in the absence of 0.3 mL RUP syringes.

Learning objectives

By the end of this training, you should be able to:

- describe what is new and different for introducing the **Pfizer-BioNTech COVID-19 Vaccine**; and
- identify key programmatic considerations involved in introducing this vaccine.

This training is intended to be used **in conjunction with:**

- raining[1] and guidance on the development of a National Vaccination and Deployment Plan (NDVP) [2],
- COVID-19 vaccination training for health workers[3],
- guidance and resources available at the WHO Country Readiness and Delivery webpage[4] , and
- Training on handling, storing and transporting Pfizer BioNTech COVID-19 Vaccine COMIRNATY® (Tozinameran) [5].

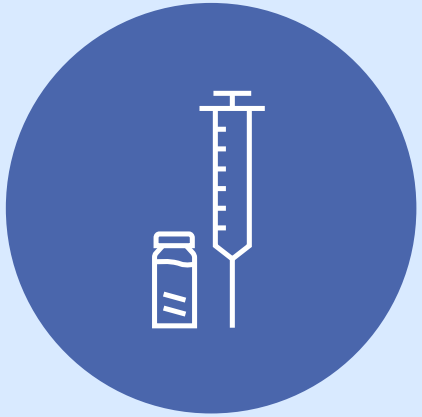
[1] https://openwho.org/courses/covid-19-ndvp-en

[2] https://www.who.int/publications/i/item/WHO-2019-nCoV-Vaccine-deployment-2021.1-eng

[3] https://openwho.org/courses/covid-19-vaccination-healthworkers-en

[4] https://www.who.int/initiatives/act-accelerator/covax/covid-19-vaccine-country-readiness-and-delivery

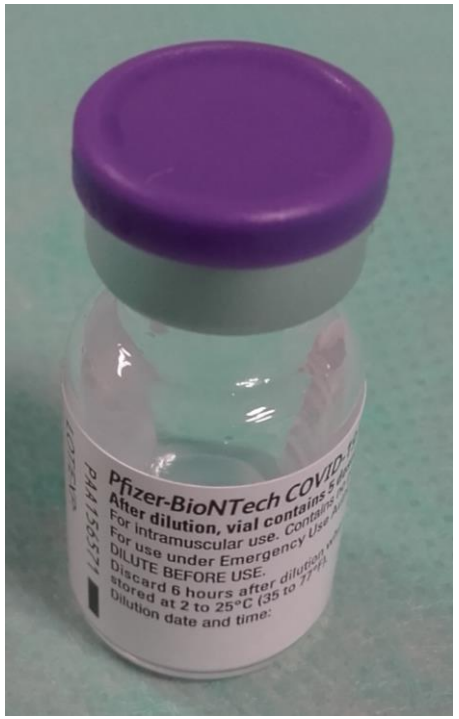
[5] pfizer-specific-training_full-deck_19aug.pdf (who.int)



1. Overview of Pfizer-BioNTech COVID-19 Vaccine COMIRNATY® (Tozinameran)*

* The vaccine will be referred to as Pfizer-BioNTech COVID-19 Vaccine in the rest of the training modules.

Pfizer-BioNTech COVID-19 vaccine type and presentation



© HZJZ Croatia

Messenger RNA (mRNA) based vaccine encoding the viral spike glycoprotein (S), unique to SARS-CoV-2

Formulated in lipid nanoparticles

Frozen, sterile, preservative and adjuvant-free multi-dose concentrate for dilution before administration

One vial (0.45mL) contains 6 doses of vaccine after dilution.

Diluent is unpreserved 0.9% sodium chloride solution for injection; 1.8mL of diluent is required per 6-dose vaccine vial.

Date of WHO EUL: December 31, 2020 (https://extranet.who.int/pqweb/vaccines/who-recommendation-covid-19-mrna-vaccine-nucleoside-modified-comirnaty)

Updated EUL recommendation: 27 April 2021

Dosage and administration

Recommended for age	12 years and older, without an upper age limit
Dose/route/site of administration	0.3 mL (after dilution), intramuscular injection in the deltoid muscle Vaccine syringe and needle: 0.3 mL auto-disable (AD) syringe, needle 23G x 1” (0.60 x 25 mm) *(See slide 22 for specification of alternative syringes in case of 0.3 mL syringe stock out.)* Mixing syringe and needle: 3 mL or 5 mL reuse prevention (RUP) syringe, needle 21G or narrower*
Recommended schedule	2 doses necessary for protection • Dose 1 – at the start date • Dose 2 – recommended interval 21 to 28 days after first dose If the 2nd dose is accidently administered earlier than 21 days, the dose need not be repeated. If the 2nd dose is inadvertently delayed, the dose should be given as soon as possible. There should be a 14-days minimum interval between this vaccine and any other vaccine. There is currently no evidence on the need for a booster dose after the current two-dose vaccine series is complete. The same product should be used for both doses though mix-and-match studies are ongoing between vaccine products and platforms.

Contraindications

- Known history of anaphylaxis to any component of this vaccine
- Do not administer to individuals who developed anaphylaxis to the first dose of this vaccine.
- Persons with an immediate non-anaphylactic reaction to the first dose (e.g. urticaria, angioedema or respiratory symptoms) without any other symptoms (e.g. cough, wheezing, stridor) that occur within 4 hours of administration should not receive additional doses, unless recommended after review by a health specialist.

Precautions

- Defer vaccination of people with acute severe febrile illness (over 38.5 °C) or acute infection, including symptomatic SARS-CoV-2 infection, until they have recovered from acute illness and the criteria for discontinuation of isolation have been met.
- Observe 30 minutes after vaccination persons with known history of any immediate allergic reaction to any other vaccine or injectable therapy. Counsel about the risks which should not outweigh the benefits of vaccination.
- Food, contact or seasonal allergies, including to eggs, gelatine and latex, eczema and asthma are **NOT** considered precautions or contraindications.

Vaccination of special population groups

Older adults: Post introduction vaccine effectiveness studies have shown high effectiveness and good safety profiles in this age group, including very old persons. Vaccination is recommended for older persons without an upper age limit.

Children & adolescents: Vaccine is not recommended for children under 12 years of age.

Pregnant women: Vaccination is recommended when the benefits of vaccination to the pregnant woman outweigh the potential risks. To help pregnant women make this assessment, they should be provided with information about the risks of COVID-19 in pregnancy, the likely benefits of vaccination, and the current limitations of safety data. WHO does not recommend pregnancy testing prior to vaccination. WHO does not recommend delaying or terminating pregnancy because of vaccination.

Lactating women: WHO recommends the use of Pfizer–BioNTech COVID-19 vaccine in lactating women as in other adults. WHO does not recommend discontinuing breastfeeding because of vaccination.

More information: https://extranet.who.int/pqweb/key-resources/documents/who-package-leaflet-biontech-tozinameran-%E2%80%93-covid-19-mrna-vaccine-nucleoside

Vaccination of special population groups

- **Persons with comorbidities:** Vaccination is recommended with comorbidities that have been identified as increasing the risk of severe COVID-19, in alignment with the WHO Prioritization Roadmap.
- **Immunocompromised persons** – may be vaccinated if part of a recommended group for vaccination. Information and, where possible, counselling should be provided to inform individual benefit-risk assessment.
- **HIV-positive persons** – can be vaccinated if well controlled on highly active antiretroviral therapy and are part of a group recommended for vaccination. Information and, where possible, counselling should be provided to inform individual benefit-risk assessment.
- **Persons who received monoclonal antibodies or convalescent plasma** as part of COVID-19 therapy – defer vaccination for at least 90 days as a precautionary measure.
- **Persons with previous SARS-CoV-2 infection**: Vaccination should be offered regardless of a person's history of symptomatic or asymptomatic SARS-CoV-2 infection, though such persons may choose to delay vaccination for up to 6 months because available data show that symptomatic reinfection is uncommon in that period. Earlier vaccination of such individuals, i.e. within 90 days following natural infection, is advised in settings where variants of concern associated with markedly reduced vaccine effectiveness are circulating.

More information: Interim recommendations for use of the Pfizer–BioNTech COVID-19 vaccine, BNT162b2, under Emergency Use Listing (who.int)

Stability and storage

Vaccine storage temperature	**Frozen vial** • at -90°C to -60°C in freezer or Pfizer Softbox* • at -25°C to -15°C for a single period of up to 2 weeks within the vaccine shelf life **Thawed vial:** • at +2°C to +8°C (see below for shelf life according to dilution)
Diluent storage temperature	Store at room temperature not exceeding 25ºC. During session, store at +2°C to +8°C. Do not freeze.
Shelf life at different temperatures	**Undiluted frozen vaccine:** • 9 months from date of manufacturing if stored and transported at -90°C to -60°C. • up to 2 weeks if stored at -25°C to -15°C for a single period within the 9-month shelf life **Undiluted thawed vaccine:** • up to 31 days if stored at +2°C to +8°C. Vaccine stored at this temperature should not be transported for longer than 12 hours. **Diluted vaccine:** • Keep at +2°C to +8 °C and use within 6 hours after dilution.
Freeze sensitivity	Do not refreeze thawed vials. Do not freeze diluted vaccine.
Light sensitivity	Minimize exposure to room light. Avoid exposure to direct sunlight and ultraviolet light.
Conditions before use	Keep the vial at +2°C to +8°C before and after dilution.
Wastage rates	Will be country context dependent
Buffer stock needed	Will be country dependent

**Pfizer Softbox can be used as temporary storage for up to 30 days from delivery (should be re-iced every 5 days if opened up to 2 times a day, less than 3 minutes at a time).*

Special storage and handling precaution

Transfers of frozen vials stored at ultra-low temperature (-90°C to -60°C)

Closed-lid vial trayboxes removed from frozen storage (-90°C to -60°C) may be at room temperature (<25°C) for a maximum of **5 minutes** when transferring from one ultra-low temperature environment to another.

Open-lid vial trayboxes, or trayboxes with less than 195 vials removed from frozen storage (-90°C to -60°C) may be at room temperature (<25°C) for a maximum of **3 minutes** when removing the number of vials needed for the vaccination session or when transferring from one ultra-low temperature environment to another. Vials removed from ultra-low temperature should be stored at either -25°C to -15°C or +2°C to +8°C temperatures.

After vial trayboxes are returned to frozen storage following room temperature exposure, they must remain in frozen storage for **at least 2 hours** before they can be removed again.

For handling dry ice and ultra-low temperature freezers, ensure that protective gear (i.e. cryogenic gloves and goggles) are available and that the space is well ventilated.

Special storage and handling precaution

Transfers of frozen vials stored at -20°C

Closed-lid vial trayboxes removed from frozen storage (-25°C to -15°C) may be at room temperature (<25°C) for a maximum of **3 minutes** when transferring from one freezing equipment to another.

Open-lid vial trayboxes, or trayboxes with less than 195 vials removed from frozen storage (-25°C to -15°C) may be at room temperature (<25°C) for a maximum of 1 **minute** when removing the number of vials needed for the vaccination session or when transferring from one freezing equipment to another. Vials should be moved to +2°C to +8°C on or before the end of the 2 weeks shelf life at -25°C to -15°C.

Once the vaccine is diluted it should be used immediately or within 6 hours and kept at +2°C to +8°C while in use.

Special storage and handling precaution

- Store at recommended storage temperatures.
- Store in the original package in order to protect from light.
- During storage, minimize exposure to room light, and avoid exposure to direct sunlight and ultraviolet light.
- Thawed vials can be handled in room light conditions.

Closely monitor and record vaccine remaining shelf life:

Upon moving the vaccine from one storage temperature to another (e.g. from -90°C to -60°C to -25°C to -15°C and/or to +2°C to +8°C storage), update the expiry date with the use of dynamic labeling.

Dynamic labeling of vaccine when moved to different storage temperature

- **Dynamic labeling** is the process of manually updating the vaccine expiration date as the vaccine moves from -90°C to -60°C to -25°C to -15°C or +2°C to +8°C storage temperatures.
- When and how to perform dynamic labeling.
  - Update the expiration date on the outer carton or traybox with the use of a permanent marker or on a labeled sticker upon moving the vaccine from one storage temperature to another.
  - Cross out the original expiration date in a manner that it remains visible.
  - Discarded the vaccine based on the new expiration date.
- All necessary transport and use of the vaccine should take place within the updated expiration date.

Possible scenarios:

If the **original expiration date at -90°C to -60°C is 31 August 2021** (e.g. 9-month shelf life from manufacturing date):

1. When vaccine is moved directly from -90°C to -60°C to +2°C to +8°C on 15 July 2021, the new expiration date will be **14 August 2021** (end of 31 days). **Do not use beyond 14 August.**

2. When vaccine is moved from -90°C to -60°C to -25°C to -15°C on **15 July** 2021, the new expiration date will be **26 August 2021** (equivalent to 15 days at -25°C to -15°C plus 31 days at +2°C to +8°C remaining shelf life). **Do not use beyond 26 August.**

3. When vaccine is moved from -90°C to -60°C to -25°C to -15°C on **15 July** 2021, the new expiration date will be **26 August 2021** (this is equivalent to 15 days at -25°C to -15°C plus 31 days at +2°C to +8°C remaining). **BUT** if on the 5th day at -25°C to -15°C (<15 days) the vaccine is thawed and stored at +2°C to +8°C, the **expiry date must be updated again** to **20 August 2021** (equivalent to 15 days at -25°C to -15°C plus 31 days at +2°C to +8°C). **Do not use beyond 20 August.**

Examples:

1

Use before: ~~31 August 2021~~
14 August 2021

2

Use before: ~~31 August 2021~~
26 August 2021

3

Use before: ~~31 August 2021~~
~~26 August 2021~~
20 August 2021

Labelling and packaging

Currently:

- No vaccine vial monitor (VVM)
- Lot number and expiration date are available and marked on label.

Secondary packaging

– Vaccine: trayboxes holding 195 vials (1170 doses); volume per dose = 1.8 cm^3

– Diluent: carton containing 25 diluent vials (10 mL vial). Also available in 2 mL vial. *(UNICEF will be delivering only 10 mL vials diluents)*

Tertiary packaging

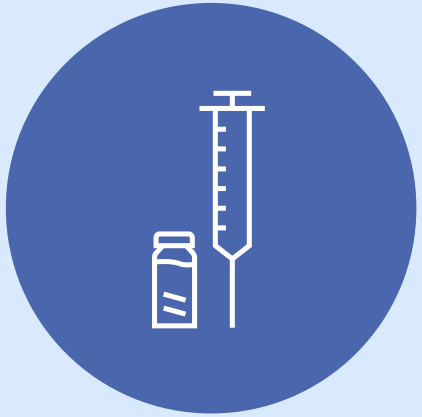
– Vaccine: insulated box containing 5 secondary cartons with a total of 975 vials (5850 doses)

– Diluent: box containing 16 secondary cartons with a total of 400 vials;

Packed volume

– Vaccine: 10.75 cm3 / vial or 1.8 cm3 / dose

– Diluent: 34.55 cm3 / vial 10 mL; 12.63 cm3 / vial 2 mL



2. Vaccine safety and regulatory considerations

Safety information

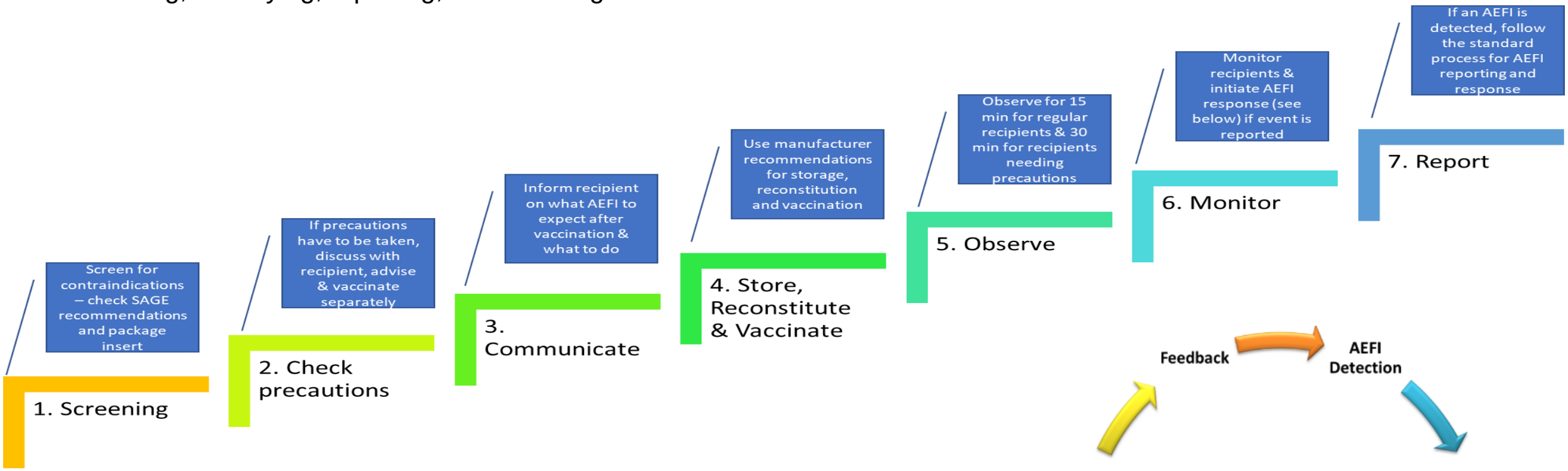
Possible events (by frequency)	
Very common (≥1/10)	headache, arthralgia, myalgia, injection site pain, fatigue, chills, pyrexia (higher frequency after 2nd dose), injection site swelling
Common (≥1/100 to <1/10)	nausea, injection site redness
Uncommon (≥1/1000 to <1/100)	lymphadenopathy, insomnia, pain in extremity, malaise, injection site itching
Rare (≥1/10 000 to < 1/1000)	Bell's palsy (acute peripheral facial paralysis)
Very Rare (< 1/10 000)	myocarditis
Not known (cannot be estimated from available data)	anaphylaxis, hypersensitivity

Co-administration of vaccines

There should be a minimum interval of 14 days between administration of this and any other vaccine (against other diseases).

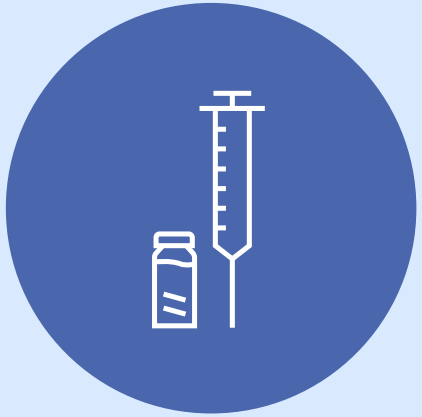
Vaccine safety

Preventing, identifying, reporting, and handling AEFI events



Important: For more information please see:

- COVID-19 vaccination training for health workers Module 4 – AEFI monitoring for COVID-19 vaccination
- COVID-19 Vaccines Safety Surveillance Manual: https://apps.who.int/iris/bitstream/handle/10665/338400/9789240018280-eng.pdf?sequence=1&isAllowed=y



3. Administration of Pfizer–BioNTech COVID-19 Vaccine

Dilution of the vaccine: key steps

Thaw vaccine before dilution:

- Frozen vials should be transferred to an environment of +2°C to +8°C to thaw prior to dilution.
- A 195-vial pack may take 3 hours to thaw .

- **Dilute vaccine before use:**

1. Before dilution, invert vaccine vial gently 10 times, **do not shake.**
2. Visually inspect the diluent and draw 1.8 mL of diluent using a syringe with 21 gauge or narrower needle.
3. Add 1.8 mL of diluent into the vaccine vial; level/equalize the pressure in the vial before removing the needle by withdrawing 1.8 mL of air into the empty diluent syringe.
4. Discard diluent syringe in safety box (do not reuse) and discard diluent vial in a separate container.
5. Gently invert the vial with diluted vaccine 10 times to mix; **do not shake.**
6. Inspect to make sure that the vaccine is an off-white uniform suspension; do not use if discoloured or if containing particles.
7. Record date and time of dilution on the vaccine vial label.
8. After dilution use immediately or store at +2°C to +8°C for up to 6 hours after dilution.
9. Draw up the vaccine dose at the time of administration, pre-loading vaccine into syringes is not recommended. Use all vaccine within 6 hours after dilution.

Important to note:
Diluent vials are single use only. After first use, discard. Never keep the used diluent vial for the preparation of the next vaccine vial.

Remember multi-dose vial policy!

Discard any unused vaccine 6 hours after dilution, or at the end of the immunization session, whichever comes first.

For more information, please refer to COVID-19 vaccination training for health workers- Module 3: Organizing COVID-19 vaccination sessions.

Maximizing number of doses available per vial

- After dilution, the vial contains 2.25 mL from which 6 doses of 0.3 mL can be extracted.
- Withdraw 0.3 mL of Pfizer–BioNTech COVID-19 Vaccine.

Low dead-volume syringes and/or needles should be used in order to extract 6 doses from a single vial. The low dead-volume syringe and needle combination should have a dead volume of no more than 0.035 mL.

If standard syringes and needles are used, there may not be sufficient volume to extract a sixth dose from a single vial.

- Each dose must contain 0.3 mL of vaccine.
- If the amount of vaccine remaining in the vial cannot provide a full dose of 0.3 mL, discard the vial and any excess volume.
- Do not combine residual vaccine from multiple vials.
- Discard any unused vaccine after 6 hours after dilution

If Prequalified 0.3ml AD syringes are not available use WHO prequalified 1ml or 2ml RUP syringes that meet the following requirements:

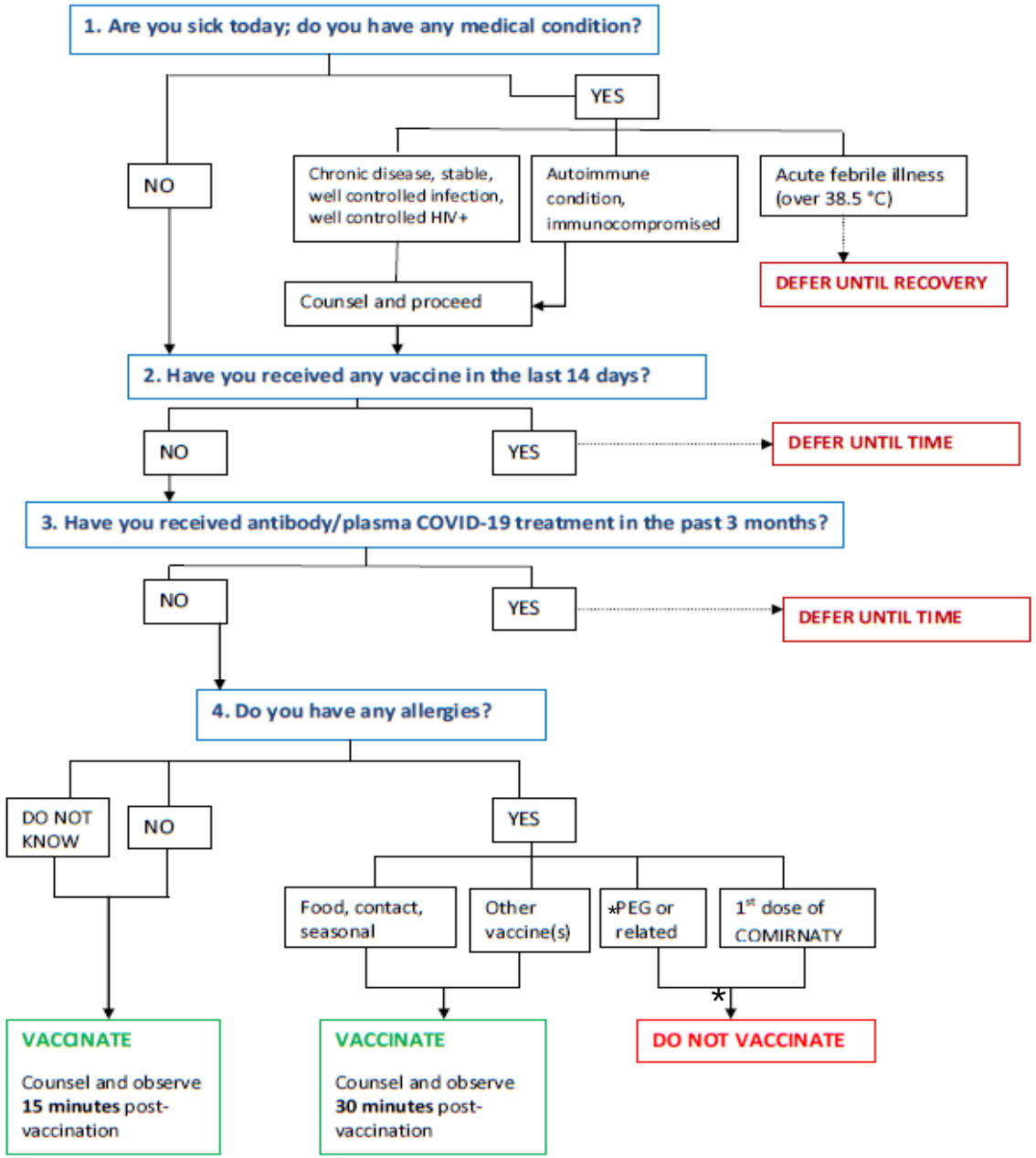
- Deadspace of syringe and needle combination: ≤ 0.035ml
- Graduation: ≤ 0.1 mL increments
- Needle: 23G x 1” (0.60 x 25 mm)
- Preferred packaging configuration: Co-packaged needle and syringe
- Needle prioritization:
    1. Fixed needle
    2. Safety luer needle
    3. Standard luer needle.

Safe vaccine administration

Administer only where appropriate medical treatment to manage anaphylaxis is immediately available.

1. Before, during and after vaccination, follow current guidance for public health and social measures.
2. Position yourself sideways to the vaccine recipient.
3. Allow time for discussion about the vaccine and ask the vaccine recipient if there are any questions.
4. Screen for contraindications and precautions (see diagram).
5. Ensure that the person is comfortably seated.
6. Administer prepared vaccine following steps for intramuscular injection.

For more information, please refer to COVID-19 vaccination training for health workers- Module 3: Organizing COVID-19 vaccination sessions.



* Polyethylene glycol

Management of anaphylaxis

• Anaphylactic reactions after administration of this vaccine have been reported outside of clinical trials.

• Anaphylaxis is rare but potentially life-threatening reaction; proper diagnosis and urgent management are essential.

Important points in management:

• Position patient lying flat on the back with legs elevated (‘supine position’).

• If unconscious, position the patient in recovery position to ensure that the airway is clear.

• Administer adrenaline intramuscularly in the opposite deltoid to that in which vaccine was administered, or in upper lateral thigh (see dosage and frequency in the table below).

Drug, site and route of administration	Frequency of administration	Dose
Adrenaline (epinephrine)1:1000, immediate IM injection to the midpoint of anterolateral aspect of the middle third of the thigh	Repeat every 5–15 min as needed until there is resolution of the anaphylaxis. Note: Persisting or worsening cough associated with pulmonary oedema is an important sign of adrenaline overdose and toxicity.	According to age Children 0.01mg/kg Adults 0.2 mL to maximum of 0.5 mL

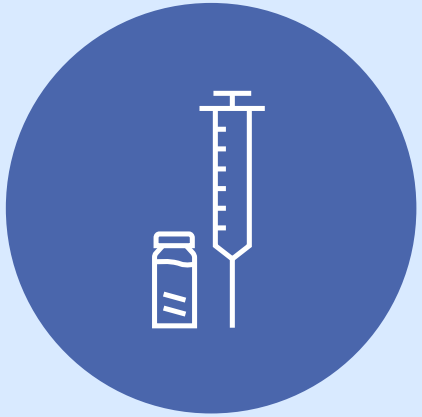
• Call for professional assistance/ambulance and never leave the patient alone.

• Inform the AEFI focal point by phone and fill in the COVID-19 AEFI reporting form with details of the occurrence.

For more information on the treatment protocol for anaphylaxis see: https://www.who.int/publications/i/item/9789241511254 .

Post vaccination

1. Discard the needle and syringe straight into the safety box, do not recap. Dispose of empty vaccine vials and other waste in a separate container or a waste bag.
2. Record vaccination in personal and facility records.
3. Advise vaccine recipient about possible post-vaccination symptoms (slide 17: Safety information).
4. Ensure that the vaccine recipient remains comfortably seated for post-vaccination observation for at least 15 minutes. **People with a history of allergic reactions should be observed for 30 minutes after receiving the vaccine**.
5. Advise the vaccine recipient that he/she may take antipyretics or analgesics to alleviate pain or temperature, if needed.
6. After the first dose of Pfizer-BioNTech COVID-19 vaccine, encourage a vaccine recipient to complete the vaccination series and schedule the time for the second dose.



4. Indemnification and liability

Indemnification and liability

- As previously communicated to countries, each AMC 92 country receiving vaccines will need to sign up to an indemnity in the form of the Model Indemnity with the relevant manufacturer.
- Countries will need to have the Model Indemnity signed and in force with Pfizer in advance of delivery.
- Each country will be supported in finalizing the Model Indemnity ready for signing and put in contact with Pfizer in order to sign.
- It is important that each country undertakes the necessary process to have the indemnity agreement in place, including concluding any necessary legislative or regulatory changes as discussed during the country consultations, as quickly as possible.
- Gavi country support teams will be the first point of contact for questions relating to the process for agreements to be signed up to.
- The terms of the Indemnity and the implementation by WHO of the global compensation scheme will apply to vaccines delivered through COVAX to AMC 92 countries.

COVAX no-fault compensation mechanism (1/2)

The purpose of the COVAX no-fault compensation program for AMC eligible economies (the “Programme”) is to **provide no-fault lump-sum compensation in full and final settlement of any claims** to persons who suffer a **serious adverse event (SAE) resulting in permanent impairment or death** after the administration of a COVID-19 vaccine procured or distributed through the COVAX Facility in any Gavi AMC eligible economies

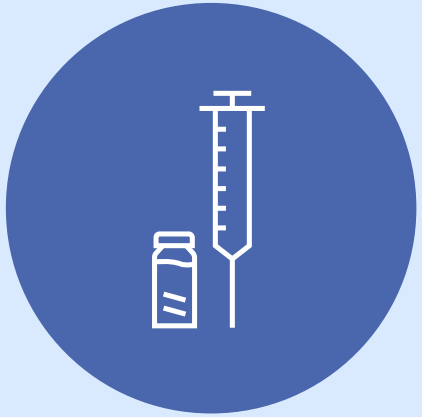
Before supply of vaccines of COVAX-distributed vaccines begins, it is important that each AMC 92 country:

- **Determine whether the acceptance by individuals of no-fault compensation under the Programme in full and final settlement of claims** relating to any permanent impairment or death resulting from COVAX-distributed vaccines or their administration, **requires any implementing legislation within the country**; and
- If implementing legislation is required (see above), **take all necessary steps to draft and fully enact such legislation.**

COVAX no-fault compensation mechanism (2/2)

Once the Compensation Programme has been established, AMC92 countries should:

- Provide to vaccine recipients and **make available the instructions on "How to submit an application"** under the Programme, which will be provided to MoHs and other relevant entry points (e.g. supply agencies for humanitarian buffer).
- Inform Registered Healthcare Professionals of the **need to carefully track/keep records of the following information** about the vaccine. Such information (among other) will be **required as part of the supporting evidence** that must accompany an Application under the Programme: (1) name of vaccine and its diluent (if any), (2) dose, (3) batch or lot number, and (4) expiry date.
- Work with the Programme's independent claims administrator to **facilitate the submission and investigation of claims**, as well as the **exchange of safety information.**
- **Raise awareness** within the country about the existence of the Programme, including by making individuals and MOHs aware that:
  - individuals will have **ample time to submit claims** from compensation for SAEs resulting in permanent impairment or death, even if such SAEs arise from COVAX-distributed vaccines **administered before the Programme** is fully operational; and
  - individuals will, in any event, **need to wait 30 days following the administration** of the COVAX-distributed vaccine **before they can complete and submit an application for compensation under the Programme**. The reason for this 30-day waiting period is to avoid that persons who suffer **non-serious** adverse events submit a claim for compensation.



5. Acceptance and uptake

Acceptance and uptake

Theme	Key message
Vaccine benefits	COVID-19 vaccine is a safe way to protect yourself from coronavirus disease. In clinical trials, the efficacy of the vaccine in people with or without prior SARS-CoV-2 infection and who received 2 doses of the vaccine was about 95%.
Eligibility	Due to the limited availability of COVID-19 vaccine, countries need to prioritize groups to receive the vaccines first in line with SAGE recommendations or country needs. Priority groups for vaccination may include health workers, older persons, people with chronic health conditions and other essential workers.
Trusted community resources	If you have questions about this COVID-19 vaccine, contact your local health facility. You can get the latest information on the Pfizer-BioNTech COVID-19 vaccine explainer available at: https://www.who.int/tools/covid-19-vaccine-introduction-toolkit
Follow-up	It is important that vaccinees receive the 2nd dose of the vaccine 21-28 days following the first dose, and within six weeks. Both doses are necessary to ensure protection.
Protection against COVID-19	Vaccination is an important way to reduce your risk for COVID-19. Before, during, and after vaccination, vaccinees should continue to wear a mask, practice physical distance, wash their hands regularly.