A PHASE 3, RANDOMIZED, DOUBLE-BLIND TRIAL TO DESCRIBE THE SAFETY AND IMMUNOGENICITY OF 20-VALENT PNEUMOCOCCAL CONJUGATE VACCINE WHEN COADMINISTERED WITH A BOOSTER DOSE OF BNT162b2 IN ADULTS 65 YEARS OF AGE AND OLDER

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Brief Title: A Phase 3 Safety and Immunogenicity Study of 20vPnC When Coadministered With a Booster Dose of BNT162b2

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1. PROTOCOL SUMMARY

1.1. Synopsis

Brief Title: A Phase 3 Safety and Immunogenicity Study of 20vPnC When Coadministered With a Booster Dose of BNT162b2

Rationale

Pfizer has developed 20vPnC to expand protection against pneumococcal disease beyond that covered by current pneumococcal vaccines in children and adults. 20vPnC has the same composition as 13vPnC (Prevnar 13®) but contains an additional 7 pneumococcal conjugates to protect against serotypes responsible for a substantial burden of remaining pneumococcal disease. 20vPnC uses the same platform and contains the same excipients as 13vPnC. 20vPnC is in late-stage clinical development, and data from Phase 3 studies in adults 18 years of age and older provide evidence that the safety profile is acceptable and similar to 13vPnC, and induces immune responses that are expected to support licensure for an adult (≥18 years of age) indication. An application to license 20vPnC for an adult indication in the US was submitted to the FDA on 08 October 2020, and licensure may occur during the conduct of this study. The US ACIP currently has recommendations for 13vPnC, which include vaccination of adults with immunocompromising and other conditions that place them at high risk of pneumococcal disease and a recommendation for immunization in adults 65 years of age and older based on decision making shared between the individual and his or her health care provider. Recommendations will be considered for 20vPnC after FDA approval.

Pfizer has also developed a vaccine to prevent infection with SARS-CoV-2 and the disease it causes, COVID-19. Study C4591001 (NCT04368728) is an ongoing Phase 1/2/3 trial in ~44,000 participants ≥12 years of age, designed to generate safety, tolerability, immunogenicity, and efficacy data from a novel RNA-based vaccine candidate. The Phase 2/3 component is assessing the safety and efficacy of two 30-µg doses of BNT162b2 COVID-19 vaccine (referred to hereafter as BNT162b2) administered 21 days apart, compared to placebo. Initial safety data through ~14 weeks after the second dose showed a safety profile similar to other viral vaccines; vaccine efficacy was 95% after the second dose and 52% after the first dose. Additionally, because of unknowns regarding duration of protection, a booster dose of BNT62b2 may be needed; this may be particularly important for older adults, who may be more vulnerable. An evaluation of a booster dose is currently in progress.

When an individual interacts with a healthcare provider to obtain a COVID-19 vaccination, this may also be an opportunity to administer another recommended vaccine for which the individual may be eligible. However, because of the current lack of safety and immunogenicity data on COVID-19 vaccines coadministered with other vaccines, current ACIP guidance is that COVID-19 vaccines should be administered alone, with a minimum interval of 14 days before or after administration of any other vaccine. Therefore, this study describing the safety and immunogenicity of coadministration of a dose of 20vPnC and a

booster dose of BNT162b2 will help provide timely data to inform potential concomitant use of those vaccines.

The purpose of this study is to describe the safety and immunogenicity of 20vPnC and a booster dose of BNT162b2 when administered together at the same visit compared to each of the vaccines given alone in adults ≥65 years of age, as shown in Section 1.2. To be eligible for this study, participants will have participated in Study C4591001 and received 2 doses of 30 µg BNT162b2, with the second dose at least 6 months prior to the first vaccination in this study.

Objectives, Endpoints, and Estimands

Objectives	Endpoints	Estimands
Primary:	**Primary:**	**Primary:**
Safety		
To describe the safety profile of 20vPnC and a booster dose of BNT162b2 when coadministered or administered alone	• Prompted local reactions at each injection site (redness, swelling, and pain at the injection site) • Prompted systemic events (fever, headache, chills, fatigue, muscle pain, and joint pain) • AEs • SAEs	In participants receiving at least 1 dose of study intervention and having safety follow-up after vaccination, the percentage of participants reporting: • Prompted local reactions at each injection site for up to 10 days following vaccination • Prompted systemic events for up to 7 days following vaccination • AEs from vaccination at Visit 1 through approximately 1 month after vaccination • SAEs from vaccination at Visit 1 through 6 months after vaccination
Secondary:	**Secondary:**	**Secondary:**
Pneumococcal Immunogenicity		
To describe the immune response elicited by 20vPnC when coadministered with a booster dose of BNT162b2 or when administered alone	• Pneumococcal OPA titers	In participants in compliance with the key protocol criteria (evaluable participants): • OPA GMTs approximately 1 month after vaccination
BNT162b2 Immunogenicity		
To describe the immune response elicited by a booster dose of BNT162b2 when coadministered with 20vPnC or when administered alone	• Full-length S-binding IgG levels	In evaluable participants: • GMCs of full-length S-binding IgG levels approximately 1 month after vaccination • GMFR in full-length S-binding IgG levels from before to approximately 1 month after vaccination

Overall Design

This Phase 3, multicenter, randomized, double-blind study will be conducted at investigator sites in the US. The purpose of this study is to describe the safety and immunogenicity of 20vPnC and a booster dose of BNT162b2 when administered together at the same visit compared to each of the vaccines given alone in adults ≥65 years of age, as shown in Section 1.2. There are no formal comparisons and the study is not designed or powered for hypothesis testing.

Approximately 600 participants from the US, 65 years of age and older who received 2 doses of 30 µg BNT162b2 in Study C4591001, will be stratified by prior pneumococcal vaccine status (no previous pneumococcal vaccine [naïve] or receipt of at least 1 dose of a pneumococcal vaccine [experienced]) and randomized at a 1:1:1 ratio to 1 of 3 vaccine groups.

At Visit 1 (Day 1), the Coadministration group (20vPnC+BNT162b2) will receive 20vPnC and a booster dose of BNT162b2, the 20vPnC-only group (20vPnC+saline) will receive 20vPnC and saline, and the BNT162b2-only group (BNT162b2+saline) will receive a booster dose of BNT162b2 and saline. Since the vaccines and saline have different appearances, they will be administered by an unblinded administrator at each site.

Participants from all groups will have blood drawn at Visit 1 prior to vaccination, and at Visit 2, approximately 1 month after vaccination, for immunogenicity assessments and serological testing for prior COVID-19 infection.

All participants will be contacted by telephone at Month 6 for collection of SAEs.

Local reactions at each injection site and systemic events occurring within 10 days and 7 days after vaccination, respectively, will be collected in an e-diary. AEs (nonserious AEs and SAEs) will be collected for each participant from the time informed consent is obtained through approximately 1 month after vaccination (Visit 2). SAEs will be collected through approximately 6 months after vaccination.

Number of Participants

Approximately 600 participants (200 per group) will be randomly assigned to study intervention.

Intervention Groups and Duration

Participants will be randomized at a 1:1:1 ratio to 1 of 3 vaccine groups. At Visit 1 (Day 1), the Coadministration group will receive 20vPnC and a booster dose of BNT162b2, the 20vPnC-only group will receive 20vPnC and saline, and the BNT162b2-only group will receive a booster dose of BNT162b2 and saline. Study intervention will be administered by

an unblinded administrator via intramuscular injection to the upper deltoid muscle of each arm.

The duration of the study for each participant is approximately 6 months.

CCI [redacted]

Statistical Methods

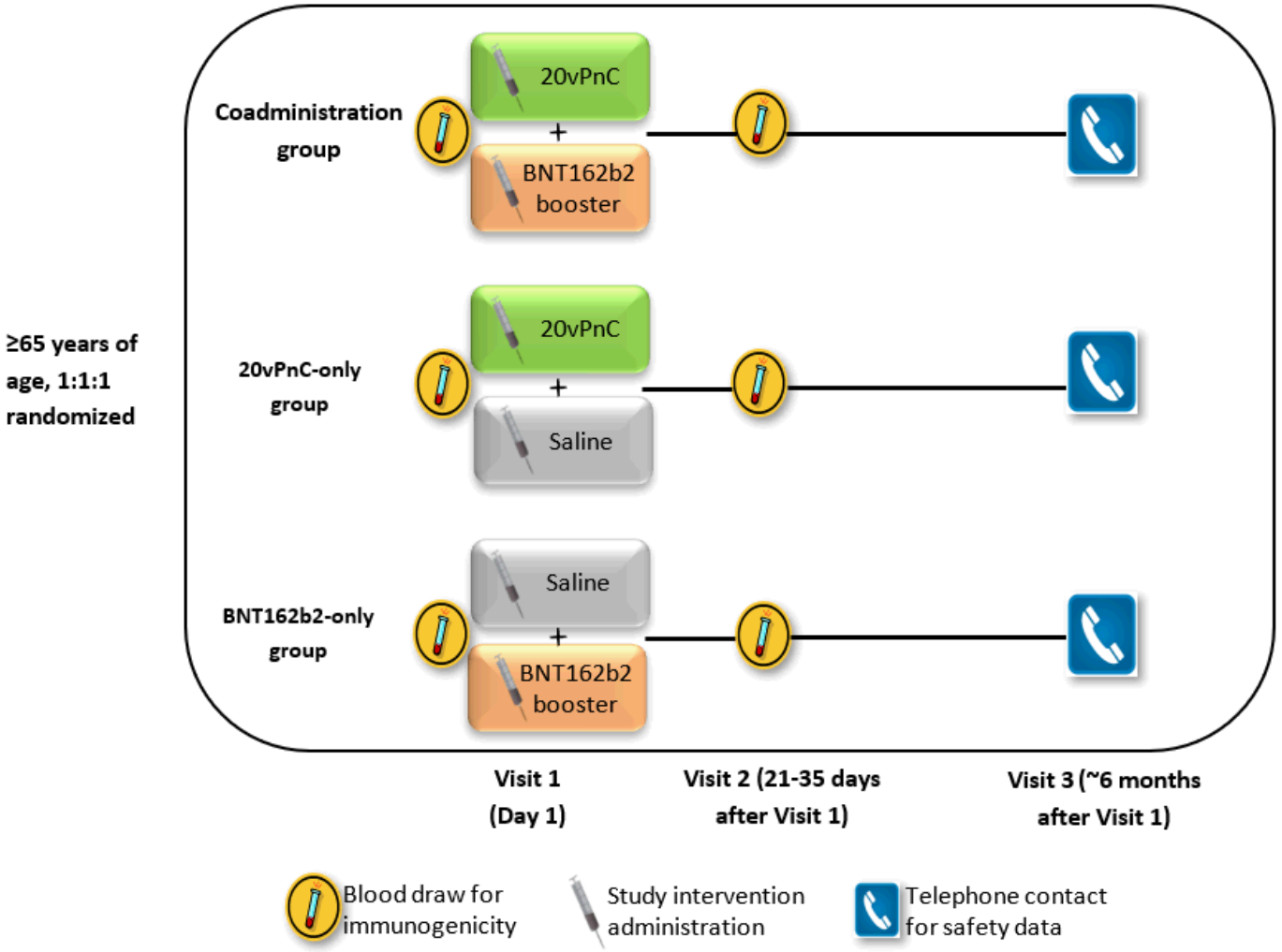
There is no formal hypothesis test for any safety or immunogenicity results. All statistical analyses will be descriptive.

Safety will be evaluated by descriptive summary statistics (including counts and percentages of participants and the associated 2-sided 95% CIs) for local reactions at each injection site, systemic events, AEs, and SAEs for each vaccine group. With 200 vaccinated participants per group, the study will provide a greater than 86% chance of observing at least 1 AE in each group if the true rate is at least 1%.

Pneumococcal immunogenicity will be evaluated descriptively by OPA GMTs approximately 1 month after 20vPnC. CCI [redacted]

BNT162b2 immunogenicity will be evaluated descriptively using GMCs of full-length S-binding IgG levels approximately 1 month after BNT162b2, and GMFR from before to approximately 1 month after BNT162b2, each with corresponding 2-sided 95% CIs in evaluable participants from the Coadministration and BNT162b2-only groups.

1.2. Schema


≥65 years of age, 1:1:1 randomized
Coadministration group
20vPnC
+
BNT162b2 booster
20vPnC-only group
20vPnC
+
Saline
BNT162b2-only group
Saline
+
BNT162b2 booster
Visit 1 (Day 1)
Visit 2 (21-35 days after Visit 1)
Visit 3 (~6 months after Visit 1)
Blood draw for immunogenicity
Study intervention administration
Telephone contact for safety data

1.3. Schedule of Activities

The SoA table provides an overview of the protocol visits and procedures. Refer to the STUDY ASSESSMENTS AND PROCEDURES section of the protocol for detailed information on each procedure and assessment required for compliance with the protocol.

The investigator may schedule visits (unplanned visits) in addition to those listed in the SoA table, in order to conduct evaluations or assessments required to protect the well-being of the participant.

Visit Identifier Abbreviations used in this table may be found in Appendix 8.	**Visit 1**	**Visit 2**	**Visit 3**
Visit Description	**Vaccination**	**Follow-up After Vaccination**	**6-Month Safety Telephone Contact[a]**
Visit Window	**Day 1**	**21 to 35 Days After Visit 1**	**168 to 196 Days After Visit 1**
Obtain informed consent	X		
Assign participant number	X		
Obtain and record the participant number assigned to the participant in Study C4591001	X		
Collect demography data	X		
Perform clinical assessment, including medical history and smoking history[b]	X		
Measure height and weight	X		
Obtain prevaccination oral temperature	X		
Collect pneumococcal vaccine history	X		
Record dates of prior BNT162b2 vaccinations received in Study C4591001	X		
Collect nonstudy vaccine information		X	
Confirm use of contraceptives (if appropriate)	X	X	
Review inclusion and exclusion criteria	X		
Review continued eligibility		X	
Assign randomization number and study intervention allocation	X		
Obtain blood sample for immunogenicity assessment & for serological testing for prior COVID-19 infection[c]	~30 mL	~30 mL	
Administer study intervention	X		

Visit Identifier Abbreviations used in this table may be found in Appendix 8.	**Visit 1**	**Visit 2**	**Visit 3**
Visit Description	**Vaccination**	**Follow-up After Vaccination**	**6-Month Safety Telephone Contact[a]**
Visit Window	**Day 1**	**21 to 35 Days After Visit 1**	**168 to 196 Days After Visit 1**
Observe and record acute reactions for 30 minutes after administration of study intervention	X		
Collect concomitant medication use for treatment of SAEs	X	X	X
Provide participant with an e-diary (device or application), thermometer, and measuring device and instruct to collect prompted local reactions, systemic events, and use of pain/antipyretic medications	X		
Provide a participant contact card	X		
Review reactogenicity e-diary data (daily review is optimal during the active diary period)		X	
Review ongoing reactogenicity e-diary symptoms with participant and obtain stop dates		X	
Collect e-diary or assist the participant to delete the application		X	
Record and report AEs	X----------X		
Record and report SAEs	X----------X		

a. Safety telephone contact should be attempted for all participants who received at least 1 dose of study intervention, unless they have withdrawn consent.
b. Including, if indicated as necessary by clinical assessment, a physical examination. Refer to Section 8.9.1 for information about medical history.
c. Administration of study intervention is not dependent on test results.

2. INTRODUCTION

2.1. Pneumococcal Disease

Streptococcus pneumoniae are gram-positive encapsulated cocci that have been a leading cause of bacteremia, bacterial meningitis, pneumonia, and AOM and continue to be a major global public health concern.[1,2,3] Serious pneumococcal disease may occur at any age; however, children <5 and adults ≥65 years of age are at particularly increased risk.[4] Individuals with certain comorbidities and immunocompromising conditions are also at increased risk, including persons with chronic heart, lung, liver, and renal disease, and those with functional asplenia.

Surveillance studies conducted in 2010 to 2012 by the CDC found that *S pneumoniae* were among the most common bacterial pathogens identified in CAP requiring hospitalization in both children and adults in the US.[5,6] Bacteremic pneumococcal pneumonia (accounting for the majority of IPD in adults) is less common than nonbacteremic pneumococcal pneumonia (an estimated 3 to 10 or more cases of nonbacteremic pneumococcal pneumonia occur for every 1 case of bacteremic pneumonia); both bacteremic and nonbacteremic pneumococcal pneumonia are associated with significant morbidity and mortality in all age groups.[1,7] Pneumococcal disease in older adults represents a high healthcare burden. Pneumococcal pneumonia accounted for 20.6% of hospitalizations with an incidence of 274/100,000 population.[8] A CDC analysis of Active Bacterial Core surveillance data from 1998-2018 showed that since the introduction of 13vPnC the incidence of IPD among adults ≥65 years of age decreased by 60%, with 13vPnC-type IPD decreasing by 86%; however, non-VT IPD increased in this age group by 22%, with serotypes 22F, 33F, and 11A among the 10 most common causes of IPD in this population.[9] In a study of the global burden of LRIs using data from 195 countries, it was estimated that LRIs were among the leading causes of death in people of all ages and pneumococcal LRIs accounted for approximately 50% of LRI deaths (1.2 million deaths) across all ages in 2016.[10] As these numbers suggest, *S pneumoniae* remains an important cause of serious disease in the US and worldwide.

Pneumococcal pneumonia is associated with coinfection with other viral respiratory infections, such as influenza. Although there is currently no substantial evidence of coinfections of COVID-19 and *S pneumoniae*,[11,12] there are reports of decreased risk of COVID-19 infection among persons who previously received 13vPnC.[13,14]

2.2. Vaccines to Prevent Pneumococcal Disease

2.2.1. Pneumococcal Polysaccharide Vaccines

The polysaccharide capsule has been identified as an important virulence factor for this pathogen. While more than 95 pneumococcal serotypes, differentiated by their capsular polysaccharide composition, have been identified, serious disease is generally caused by a smaller subset of serotypes.[15,16] Anticapsular antibodies, directed against the specific serotype, bind to the capsule and promote complement-mediated opsonophagocytic killing and clearance of the organism.[17] Pneumococcal disease can be prevented with

polysaccharide-based vaccines that induce antibody responses with functional (opsonophagocytic) activity and target the capsular serotypes responsible for disease.[18]

Vaccines containing free polysaccharides have been licensed since the 1970s. One such vaccine, PPSV23, has been licensed in the US since 1983.[19] PPSV23 elicits a T-cell–independent immune response. Unconjugated polysaccharide vaccines do not induce robust responses in certain populations (eg, immunocompromised persons), nor do they generate immunologic memory, and their protective effect wanes over 2 to 5 years.[4,20,21,22] Moreover, their ability to prevent nonbacteremic pneumonia is limited or lacking.[18,22,23,24] Another limitation is that in several studies, individuals vaccinated with pneumococcal polysaccharide vaccine had lower functional antibody responses following subsequent vaccination with either another dose of pneumococcal polysaccharide vaccine or a dose of pneumococcal conjugate vaccine, compared to the first dose of polysaccharide vaccine.[25,26,27] Such "hyporesponsiveness" has been observed with other polysaccharide vaccines as well and raises concern regarding the quality of response after revaccination or natural exposure to an invading VT pneumococcus.[28] Despite waning immunity, these concerns of hyporesponsiveness, as well as other factors, have led most recommending bodies to restrict PPSV23 to a single lifetime dose in adults ≥65 years of age and 1 to 2 doses in most other high-risk populations.[28,29,30]

2.2.2. Pneumococcal Polysaccharide Conjugate Vaccines

Pneumococcal conjugate vaccines contain polysaccharides that are covalently linked (conjugated) to an immunogenic protein. This modification results in T-cell–dependent immune responses, which have been shown to be protective in young children, older adults, and populations with high-risk conditions.[21,31] Prevnar® (7vPnC) was the first pneumococcal conjugate vaccine to be licensed (2000) and was indicated for prevention of pneumococcal disease in infants and young children on the basis of efficacy studies. 7vPnC contained capsular polysaccharide conjugates for 7 pneumococcal serotypes (4, 6B, 9V, 14, 18C, 19F, and 23F), each covalently linked to CRM_{197}, a nontoxic variant of diphtheria toxin. Following the introduction of 7vPnC, a reduction of nasopharyngeal carriage and transmission has resulted in indirect herd effects, with a 92% reduction of 7vPnC VT IPD in older adults ≥65 years of age.[32]

Prevnar 13® (13vPnC) was developed to expand serotype coverage and was licensed in the US in 2010. 13vPnC includes the same *S pneumoniae* serotypes as 7vPnC and an additional 6 polysaccharide conjugates for serotypes 1, 3, 5, 6A, 7F, and 19A.[31,33,34] The vaccine was licensed for use in infants and young children based on comparisons of serotype-specific IgG to 7vPnC, with supportive data to demonstrate the functional activity of the immune responses. 13vPnC was subsequently licensed in adults based on an accelerated approval pathway demonstrating comparable serotype-specific OPA responses to PPSV23, followed by traditional approval based on demonstration of efficacy against VT CAP in Community-Acquired Pneumonia Immunization Trial in Adults (CAPiTA), a randomized controlled study of adults ≥65 years of age.[35] Prevention of nonbacteremic VT CAP in this older adult population was also demonstrated and protection was observed through 4 years of

follow-up. This is notable given the lack of definitive data showing that PPSV23 prevents nonbacteremic disease in older adults, and the evidence that protection against IPD wanes significantly over time.[20]

Prevnar 13 was licensed for adults ≥50 years of age in 2011 and recommended by the ACIP for use in adults with immunocompromising conditions in 2012.[30,36,37,38] In July 2016, it was also licensed for use in adults 18 to 49 years of age. The potential burden of VT CAP in adults in the US was demonstrated by a study conducted well after the introduction of Prevnar 13 into the routine infant immunization schedule, suggesting potential value in direct immunization of adults rather than reliance solely on the herd effect.[39] 13vPnC is currently recommended for adults ≥65 years of age, based on shared decision-making between the individual and his or her healthcare practitioner. The prevalence of IPD due to most of the serotypes contained only in PPSV23 has remained stable or slightly increased in the US and other countries, despite continued recommendation and use of PPSV23 in adults ≥65 years of age and high-risk adults.[9,40,41,42] These serotypes account for a significant amount of pneumococcal disease and their continued presence highlights the need for a better vaccine than PPSV23 to expand protection.

2.3. Development of 20vPnC

The 20vPnC candidate is modeled after 7vPnC and 13vPnC. 20vPnC contains the polysaccharides of capsular serotypes present in 13vPnC and 7 new capsular polysaccharides (for serotypes 8, 10A, 11A, 12F, 15B, 22F, and 33F) individually conjugated to CRM_{197}. The 7 additional serotypes were selected based on their relative prevalence as a cause of IPD, their generalized geographic distribution, and other factors that would support inclusion, such as the presence of antibiotic resistance (11A, 15B), association with outbreaks (8, 12F), and greater disease severity (eg, meningitis, mortality) (10A, 11A, and 22F).[43,44,45,46,47,48,49,50,51,52,53,54,55,56] These 7 serotypes have a long-standing association with serious pneumococcal disease and are responsible for a substantial burden of remaining pneumococcal disease.[9,42]

The 20vPnC clinical development program in adults has included several trials, including 2 Phase 1 trials in healthy adults; 1 Phase 2 trial in adults 60 through 64 years of age; and 4 Phase 3 trials in adults ≥18 years of age. Studies in pediatric populations are also ongoing.

In Phase 1 and Phase 2 trials, 20vPnC induced immune responses to the pneumococcal serotypes in the vaccine. The Phase 3 pivotal trial (B7471007) met its primary immunogenicity objectives of noninferiority for all serotypes matched to the licensed Prevnar 13 and 6 of the 7 additional serotypes when compared to PPSV23. The primary endpoint for 1 of the new 7 serotypes (serotype 8) missed the noninferiority criteria by a small margin, but further characterization data showed that 20vPnC elicited a robust immune response to that serotype. Secondary immunogenicity objectives showed that 20vPnC elicited immune responses in adults 18 to 59 years of age that met or exceeded responses to all 20 serotypes in adults 60 to 64 years of age. Together these findings suggest that protective antibodies against all 20 serotypes were elicited by 20vPnC, and that protection

against pneumococcal disease will be expected to be similar to 13vPnC. The safety objectives were met in adults ≥18 years of age, demonstrating that the safety and tolerability of 20vPnC were comparable to licensed pneumococcal vaccines.

Additionally, the Phase 3 program has demonstrated equivalence of immunogenicity among 3 different lots of 20vPnC in a clinical lot-consistency trial, and 20vPnC has acceptable safety and elicits immune responses to the 20 vaccine serotypes in adults previously vaccinated with pneumococcal vaccines. An application to license 20vPnC for an adult indication in the US was submitted to the FDA on 08 October 2020, and licensure may occur during the course of this study.

Additional description of the clinical trial results, epidemiology of the 7 serotypes, and clinical (and nonclinical) program are described in the 20vPnC IB.

2.4. Indication

20vPnC has been developed in adults for the prevention of pneumococcal disease (including pneumonia and invasive disease) caused by *S pneumoniae* serotypes 1, 3, 4, 5, 6A, 6B, 7F, 8, 9V, 10A, 11A, 12F, 14, 15B, 18C, 19A, 19F, 22F, 23F, and 33F in adults ≥18 years of age.

2.5. Coronavirus Disease 2019 (COVID-19)

In December 2019, a pneumonia outbreak of unknown cause occurred in Wuhan, China. In January 2020, it became clear that a novel coronavirus (2019-nCoV) was the underlying cause. Later in January, the genetic sequence of the 2019-nCoV became available to the WHO and the public (MN908947.3), and the virus was categorized in the *Betacoronavirus* subfamily. By sequence analysis, the phylogenetic tree revealed a closer relationship to SARS virus isolates than to another coronavirus infecting humans, the MERS virus.[57,58]

The outbreak was declared a Public Health Emergency of International Concern on 30 January 2020.[59] On 12 February 2020, the virus was officially named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and the WHO officially named the disease caused by SARS-CoV-2 as coronavirus disease 2019 (COVID-19).[59] SARS-CoV-2 infections and the resulting disease, COVID-19, have spread globally and on 11 March 2020, the WHO characterized the COVID-19 outbreak as a pandemic.[60] On 03 April 2021, The Center for Systems Science and Engineering at Johns Hopkins University reported more than 130 million cases globally, with over 2.8 million deaths from 192 countries. The US has reported more than 30.6 million cases and over 554,000 deaths.[61]

Pfizer has developed a vaccine to prevent infection with SARS-CoV-2 and the disease it causes, COVID-19. A prophylactic, RNA-based SARS-CoV-2 vaccine provides one of the most flexible and fastest approaches available to immunize against the emerging virus.[62,63] In an attempt to prevent the spread of disease and to control the pandemic, numerous COVID-19 vaccine candidates are in development.

Study C4591001 is an ongoing Phase 1/2/3 trial in ~44,000 participants ≥12 years of age. The study consists of 2 parts: Phase 1: to identify the preferred vaccine candidate (BNT162b1 or BNT162b2) and dose level; Phase 2/3: an expanded-cohort and efficacy part for the selected vaccine candidate (BNT162b2).

Based on the C4591001 Phase 1/2/3 study safety, immunogenicity, and efficacy data, a 2-dose series of BNT162b2 has been either authorized for emergency use or licensed in multiple countries. The primary 2-dose series of 30 µg BNT162b2 (Pfizer-BioNTech COVID-19 vaccine) received emergency use authorization in the US on 11 December 2020, and an application for licensure will be submitted to the FDA in the near future. As of 20 December 2020 in the US, the ACIP recommends a stepwise approach to COVID-19 vaccination that includes all adults ≥65 years of age when supply is sufficient.[64]

The potential duration of protection afforded after SARS-CoV-2 infection or after vaccination remains unknown.[65,66,67,68] Because of the unknowns regarding duration of protection, a booster dose of BNT162b2 may be needed. This may be particularly important for older adults, who may be more vulnerable. Study C4591001 now includes a subset of Phase 1 participants who will receive a third dose of BNT162b2 approximately 6 to 12 months after their second dose of BNT162. The data from that will provide an early assessment of the safety of a third dose of BNT162, as well as its immunogenicity; no new safety signals have been identified as of March 2021 (study is ongoing).

2.6. Study Rationale

When an individual interacts with a healthcare provider to obtain a COVID-19 vaccination, this may also be an opportunity to administer another recommended vaccine for which the individual may be eligible. However, because of the current lack of safety and immunogenicity data on COVID-19 vaccines coadministered with other vaccines, current ACIP guidance is that COVID-19 vaccines should be administered alone, with a minimum interval of 14 days before or after administration of any other vaccine.[68] Therefore, assessing the safety and immunogenicity of coadministration of a dose of 20vPnC and a dose of BNT162b2 will help provide timely data to inform potential concomitant use of those vaccines.

The purpose of this study is to describe the safety and immunogenicity of 20vPnC and a booster dose of BNT162b2 when administered together at the same visit compared to each of the vaccines given alone in adults ≥65 years of age, as shown in Section 1.2. To be eligible for this study, participants will have participated in Study C4591001 and received 2 doses of 30 µg BNT162b2, with the second dose at least 6 months prior to the first vaccination in this study.

2.7. Background

20vPnC has been developed to further expand protection beyond 13vPnC against the global burden of vaccine-preventable pneumococcal disease in children and adults. The clinical development program in adults has been generally modeled on the 13vPnC program. The

clinical program is currently in late-stage development. To date, 2 Phase 1, 1 Phase 2, and 4 Phase 3 studies in adults have been conducted to support licensure for an adult indication. These are all safety and immunogenicity studies.

BNT162b2 is a SARS-CoV-2–RNA-LNP vaccine based on a platform of modRNA with blunted innate immune sensor–activating capacity and augmented expression encoding P2 S. The development of an RNA-based vaccine encoding a viral antigen, which is then expressed by the vaccine recipient as a protein capable of eliciting protective immune responses, provides significant advantages over more traditional vaccine approaches. Unlike live attenuated vaccines, RNA vaccines do not carry the risks associated with infection and may be given to people who should not receive live virus vaccine (eg, pregnant women and immunocompromised persons). RNA-based vaccines are manufactured via a cell-free in vitro transcription process, which allows an easy and rapid production and the prospect of producing high numbers of vaccination doses within a shorter time period than achieved with traditional vaccine approaches. This capability is pivotal to enable the most effective response in outbreak scenarios.

2.7.1. Clinical Overview

For 20vPnC, safety data from 3 Phase 3 adult studies (B7471006, B7471007, and B7471008) have shown safety profiles consistent with other pneumococcal conjugate vaccines. Immunogenicity data from the pivotal Phase 3 study demonstrated that 20vPnC induces OPA GMTs that are noninferior to 13vPnC for the 13 matched serotypes and noninferior to PPSV23 for 6 of the 7 additional serotypes. The remaining serotype demonstrated strong immune responses. See the 20vPnC IB for additional details.

Study C4591001 (NCT04368728) is an ongoing Phase 1/2/3 trial in ~44,000 participants 12 years of age and older, designed to generate safety, tolerability, immunogenicity, and efficacy data from a novel RNA-based vaccine candidate.[69] The Phase 2/3 component is assessing the safety and efficacy of two 30-µg doses of BNT162b2 administered 21 days apart, compared to placebo. Initial safety data through ~14 weeks after the second dose showed a safety profile similar to other viral vaccines; VE was 95% after the second dose and 52% after the first dose.[69] See the BNT162 IB for additional details.

2.8. Benefit/Risk Assessment

The safety profile of 20vPnC is expected to be similar to 13vPnC, but AEs may be different with the investigational 20vPnC. The safety profiles are expected to be similar because 20vPnC contains the same components and excipients as 13vPnC, along with the polysaccharide conjugates for 7 additional pneumococcal serotypes, and to date, 20vPnC has demonstrated a safety profile similar to 13vPnC in clinical trials. The most common AEs noted in adults after vaccination are primarily related to local reactions (injection site pain, redness, and swelling) and systemic events (fever, headache, fatigue, joint pain, and muscle pain). Safety review of data from the 3 completed Phase 3 adult trials has not revealed any unexpected safety concerns. See the 20vPnC IB for additional details.

As of March 2021, there are limited approved or licensed preventive or therapeutic options available for the ongoing global pandemic of COVID-19.

In the C4591001 study, the observed safety profile to date shows mostly mild reactogenicity, low incidence of severe or serious events, and no clinically concerning safety observations. BNT162b2 has been shown to elicit increased local and systemic adverse reactions as compared to those in the placebo arm, usually lasting a few days. Adverse reactions characterized as reactogenicity were generally mild to moderate. The number of participants reporting hypersensitivity-related AEs was numerically higher in the active vaccine group compared with the placebo group (137 [0.63%] vs 111 [0.51%]). Severe adverse reactions occurred in 0.0% to 4.6% of participants, and were generally less frequent in older adults (>55 years of age) (<2.8%) compared to younger participants (≤4.6%). Among reported unsolicited AEs, lymphadenopathy occurred much more frequently in the active vaccine group than the placebo group and is plausibly related to vaccination.[70] See the BNT162 IB for additional details.

As with any vaccine, an allergic reaction can occur. The allergic reaction can vary from skin rash to swelling of the face or lips, wheezing, and/or shortness of breath. A severe allergic reaction (anaphylactic shock, collapse, or shock-like state [hypotonic-hyporesponsive episode]) may also occur. There may also be additional risks related to the vaccines administered in the study that are not known at this time.

Additional potential risks of clinical significance are presented in the table in Section 2.8.1.

More detailed information about the known and expected benefits and risks and reasonably expected AEs of 20vPnC and BNT162b2 may be found in the respective IBs, which are the SRSDs for this study.

2.8.1. Risk Assessment

Potential Risk of Clinical Significance	Summary of Data/Rationale for Risk	Mitigation Strategy
Study Intervention: Vaccination With 20vPnC		
The relevant key risks associated with 20vPnC include: local reactions (injection site pain, redness, and swelling); and systemic events (fever, headache, fatigue, joint pain, and muscle pain). Uncommon events can include allergic reactions, which may be associated with skin rash, face or lip swelling, wheezing, shortness of breath, or rarely severe allergic reaction (eg, anaphylactic shock).	The risks are derived from the experience with the related 7vPnC and 13vPnC clinical trials and postmarketing data and the 20vPnC clinical data described in the 20vPnC IB.	• Eligibility criteria have been selected to ensure that only appropriate participants are included in the study (see Section 5). • All study participants will be observed for 30 minutes after vaccination. • E-diary and AE data will be monitored by the investigator (or designee) and sponsor.
Study Intervention: Vaccination With BNT162b2		
Potential for local reactions (injection site redness, injection site swelling, and injection site pain) and systemic events (fever, fatigue, headache, chills, vomiting, diarrhea, muscle pain, and joint pain) following vaccination. Risks associated with BNT162b2 include the following: • Common or very common events: injection site pain, swelling, or redness, fatigue, fever, chills, headache, joint aches, muscle aches, nausea. • Uncommon events: enlarged lymph glands, allergic reactions (including rash, itching, hives, and swelling of the face or lips), pain in the arm, and feeling weak or unwell. • Frequency cannot be estimated from available data: severe allergic reaction (anaphylaxis).	These are adverse reactions based on clinical study results and information gathered during general use.	• Eligibility criteria have been selected to ensure that only appropriate participants are included in the study (see Section 5). • All study participants will be observed for 30 minutes after vaccination. • E-diary and AE data will be monitored by the investigator (or designee) and sponsor.

Potential Risk of Clinical Significance	Summary of Data/Rationale for Risk	Mitigation Strategy
Safety profile of a novel vaccine not yet fully characterized.	Data available from Study C4591001 showed low incidence of severe or serious events, and no clinically concerning safety observations. The vaccine appears to be safe and well tolerated across the safety population and within demographic subgroups based on age, sex, race/ethnicity, country, and baseline SARS-CoV-2 status.	• Eligibility criteria have been selected to ensure that only appropriate participants are included in the study (see Section 5). • AE and SAE reports will be collected from signing of the ICD through approximately 1 month after vaccination. • All participants will be observed for 30 minutes after vaccination.
Potential for COVID-19 enhancement.	Disease enhancement has been seen following vaccination with RSV, feline coronavirus, and Dengue virus vaccines. No evidence of disease enhancement has been seen in a large-scale clinical study of BNT162b2 in humans.[69]	• Eligibility criteria will exclude any participants who have had a previous positive SARS-CoV-2 NAAT result in Study C4591001. This will minimize the low risk of potential disease enhancement and ensure that the immune response evaluated in the study is not impacted by serological changes due to previous COVID-19 disease.
Study Procedures: Venipuncture		
There is the risk of fainting, and pain, swelling, bruising, and infection at the venipuncture site.	Venipuncture is required to collect immunogenicity data from participants.	Only qualified nurses, physicians, nurse practitioners, physician assistants, phlebotomists, or medical assistants certified or otherwise authorized to draw blood per the standards and procedures of the investigative site, as allowed by institutional, local, and country guidance, will be allowed to draw blood, to minimize local complications.
Other		
Participants will be required to attend healthcare facilities during the global SARS-CoV-2 pandemic.	Without appropriate social distancing and PPE, there is a potential for increased exposure to SARS-CoV-2.	• Pfizer will work with sites to ensure an appropriate COVID-19 prevention strategy.

2.8.2. Benefit Assessment

Pneumococcal conjugate vaccines have been shown to elicit T-cell–dependent immune responses, which have been shown to be protective in older adults. A safe and immunogenic pneumococcal conjugate vaccine with expanded pneumococcal serotype coverage would fulfill an unmet need for expanded protection against pneumococcal disease.

If 20vPnC is approved, it is anticipated to provide a benefit to a participant in the prevention of pneumonia and invasive disease caused by vaccine serotypes.

Individual participants may also benefit from the receipt of a booster dose of an efficacious COVID-19 vaccine during a global pandemic, access to COVID-19 diagnostic testing, and contributing to research to help others in a time of global pandemic.

2.8.3. Overall Benefit/Risk Conclusion

Taking into account the measures to minimize risk to study participants, the potential risks identified in association with 20vPnC and BNT162b2 are justified by the anticipated benefits that may be afforded to participants.

3. OBJECTIVES, ENDPOINTS, AND ESTIMANDS

Objectives	Endpoints	Estimands
Primary:	**Primary:**	**Primary:**
Safety		
To describe the safety profile of 20vPnC and a booster dose of BNT162b2 when coadministered or administered alone	• Prompted local reactions at each injection site (redness, swelling, and pain at the injection site) • Prompted systemic events (fever, headache, chills, fatigue, muscle pain, and joint pain) • AEs • SAEs	In participants receiving at least 1 dose of study intervention and having safety follow-up after vaccination, the percentage of participants reporting: • Prompted local reactions at each injection site for up to 10 days following vaccination • Prompted systemic events for up to 7 days following vaccination • AEs from vaccination at Visit 1 through approximately 1 month after vaccination • SAEs from vaccination at Visit 1 through 6 months after vaccination
Secondary:	**Secondary:**	**Secondary:**
Pneumococcal Immunogenicity		
To describe the immune response elicited by 20vPnC when coadministered with a booster dose of BNT162b2 or when administered alone	• Pneumococcal OPA titers	In participants in compliance with the key protocol criteria (evaluable participants): • OPA GMTs approximately 1 month after vaccination

Objectives	Endpoints	Estimands
BNT162b2 Immunogenicity		
To describe the immune response elicited by a booster dose of BNT162b2 when coadministered with 20vPnC or when administered alone	• Full-length S-binding IgG levels	In evaluable participants: • GMCs of full-length S-binding IgG levels approximately 1 month after vaccination • GMFR in full-length S-binding IgG levels from before to approximately 1 month after vaccination

CCI [redacted]

4. STUDY DESIGN

4.1. Overall Design

This Phase 3, multicenter, randomized, double-blind study will be conducted at investigator sites in the US. The purpose of this study is to describe the safety and immunogenicity of 20vPnC and a booster dose of BNT162b2 when administered together at the same visit compared to each of the vaccines given alone in adults ≥65 years of age, as shown in Section 1.2. There are no formal comparisons and the study is not designed or powered for hypothesis testing.

Approximately 600 participants ≥65 years of age who received 2 doses of 30 µg BNT162b2 at least 6 months previously in Study C4591001 will be randomized at a 1:1:1 ratio to 1 of 3 groups with center-based randomization: Coadministration group, 20vPnC-only group, and BNT162b2-only group, stratified by prior pneumococcal vaccine status (no previous pneumococcal vaccine [naïve] or receipt of at least 1 dose of a pneumococcal vaccine [experienced]).

At Visit 1 (Day 1), participants will be assessed for eligibility, including medical history and pneumococcal vaccine history. If eligible, participants will have blood drawn for immunogenicity assessments and serological testing for prior COVID-19 infection and participants will be randomized to 1 of 3 vaccine groups. The Coadministration group (20vPnC+BNT162b2) will receive 20vPnC and a booster dose of BNT162b2, and the separate administration groups (20vPnC-only group [20vPnC+saline]) and BNT162b2-only group [BNT162b2+saline]) will receive either 20vPnC and saline or a booster dose of BNT162b2 and saline. All study interventions will be prepared and administered by an unblinded investigator site staff member. Participants will be observed for 30 minutes after vaccination by blinded investigator site staff, and any reactions occurring during that time will be recorded as AEs.

At Visit 1, participants will receive an e-diary (device or mobile-device application), thermometer, and measuring device (caliper) and will be instructed to record prompted local reactions (redness, swelling, and pain at the injection site) occurring at each injection site within 10 days after vaccination (Days 1 through 10, where Day 1 is the day of vaccination) and prompted systemic events (fever, headache, chills, fatigue, muscle pain, and joint pain) occurring within 7 days after vaccination (Days 1 through 7, where Day 1 is the day of vaccination) daily in the e-diary. Separate e-diary entries will be captured for local reactions occurring at the left and right arm injection sites. Participants will also be instructed to record any use of antipyretic/pain medications in the e-diary daily for 7 days after vaccination. Participants will be instructed to contact the study staff if they experience redness or swelling at either injection site measuring >20 measuring device units (>10 cm) or severe injection site pain (prevents daily activity) in the 10 days after vaccination, a severe systemic event in the 7 days after vaccination, or have an emergency room visit or hospitalization.

At Visit 2 (21 to 35 days after Visit 1), participants will return to the investigator site and be assessed for continued eligibility. Participants will be asked to provide information on any AEs (including nonserious AEs and SAEs), and on any needed e-diary follow-up. Participants will also be asked for information on concomitant medications used to treat any SAEs and on any nonstudy vaccines they received since Visit 1. Blood will be drawn for immunogenicity assessments and serological testing for prior COVID-19 infection.

At Visit 3 (6 months [168 to 196 days] after Visit 1), the site will contact the participant via telephone to inquire about SAEs and concomitant medications used to treat SAEs since the last visit.

Since participation in Study C4591001 for safety follow-up may be ongoing for participants in this study, safety events relevant to both protocols will be reported as applicable.

The duration of this study for each participant is approximately 6 months.

If either 20vPnC or a booster dose of BNT162b2 becomes licensed or authorized for emergency use during the conduct of this study, and the participant meets local/national recommendations for receipt of the applicable vaccine/dose, unblinding to vaccine assignment may be allowed after Visit 2 so that participants may be vaccinated, outside of this study, with the vaccine not received at Visit 1.

4.2. Scientific Rationale for Study Design

The purpose of this study is to describe the safety and immunogenicity of 20vPnC and a booster dose of BNT162b2 when administered together at the same visit compared to each of the vaccines given alone in adults ≥65 years of age. Coadministration of 20vPnC with a booster dose of BNT162b2 was selected based on the expected uptake of COVID-19 vaccine among persons ≥65 years of age in the US. The safety and immunogenicity results from this study will help inform potential considerations for coadministration of 20vPnC and BNT162b2. This study includes assessments similar to those in the 20vPnC and BNT162b2 studies.[71,72]

Participants in this study will be randomized to 1 of 3 groups. The Coadministration group receives both vaccines, while the 2 other groups serve as controls for each vaccine given separately.

CCI [redacted]

4.2.1. Diversity of Study Population

Reasonable attempts will be made to enroll participants to ensure the study population is representative of the US population ≥65 years of age. However, since the study population is coming from Study C4591001, in order to ensure booster dosing with the appropriate interval from the last dose of primary vaccination, diversity is limited to that within the study population of adults 65 years of age and older.

4.2.2. Choice of Contraception/Barrier Requirements

Human reproductive safety data are not available for 20vPnC and BNT162b2, but there is no suspicion of human teratogenicity based on the intended pharmacology of the compound. The use of an acceptable method of contraception is required CCI [redacted].

4.3. Justification for Dose

The 20vPnC candidate is modeled after 7vPnC and 13vPnC, and contains capsular polysaccharides from pneumococcal serotypes 1, 3, 4, 5, 6A, 6B, 7F, 8, 9V, 10A, 11A, 12F, 14, 15B, 18C, 19A, 19F, 22F, 23F, and 33F individually conjugated to CRM_{197}. The vaccine formulation contains 2.2 µg of each saccharide, except for 4.4 µg of 6B, per 0.5-mL dose. In adults, administration of 1 dose of pneumococcal conjugate vaccine induces immune responses.

Based on data from the Phase 1 component of Study C4591001 and available nonclinical data, the modRNA BNT162b2 vaccine candidate was selected at a dose of 30 µg for Phase 2/3 evaluation of safety, immunogenicity, and efficacy. This is the dose that has shown to be efficacious and has been authorized for conditional or emergency use and is anticipated to be licensed in the future.

For these products the term "dose" refers to an injection of a vaccine or placebo.

4.4. End of Study Definition

The end of the study is defined as the date of the last visit of the last participant in the study.

A participant is considered to have completed the study if he/she has completed all periods of the study, including the final safety telephone contact.

5. STUDY POPULATION

This study can fulfill its objectives only if appropriate participants are enrolled. The following eligibility criteria are designed to select participants for whom participation in the study is considered appropriate. All relevant medical and nonmedical conditions should be taken into consideration when deciding whether a particular participant is suitable for this protocol.

Prospective approval of protocol deviations to recruitment and enrollment criteria, also known as protocol waivers or exemptions, is not permitted.

5.1. Inclusion Criteria

Participants are eligible to be included in the study only if all of the following criteria apply:

Age and Sex:

1. Male or female participants ≥65 years of age at the time of consent.

   - Refer to CCI [redacted] for reproductive criteria for male CCI [redacted] and female CCI [redacted] participants.

Type of Participant and Disease Characteristics:

2. Participating or participated in Study C4591001, received 2 doses of 30 µg BNT162b2 with the second dose given ≥6 months prior to the first vaccination in this study, and have not received a third dose of BNT162b2.

3. Participants who are willing and able to comply with all scheduled visits, treatment plan, laboratory tests, lifestyle considerations, and other study procedures.

4. Participants who are determined by medical history, physical examination (if required), and clinical judgment of the investigator to be eligible for inclusion in the study.

   Note: Participants with preexisting stable disease, defined as disease not requiring significant change in therapy or hospitalization for worsening disease during the 6 weeks before enrollment, can be included. Specific criteria for participants with known stable infection with HIV or HBV or cured HCV infection can be found in Section 10.9.

5. Expected to be available for the duration of the study and can be contacted by telephone during study participation.

6. Male participant who is able to father children and willing to use an acceptable method of contraception as outlined in this protocol for at least 28 days after the last dose of study intervention; or female participant not of childbearing potential; or male participant not able to father children.

   CCI [redacted]

7. Adults who have no history of ever receiving a pneumococcal vaccine (ie, pneumococcal vaccine–naïve), or received a licensed pneumococcal vaccination ≥12 months prior to the first vaccination in this study.

   Note: For participants with a history of receiving a licensed pneumococcal vaccination, documentation of date(s) and type(s) of prior pneumococcal vaccination(s) will be obtained.

Informed Consent:

8. Capable of giving signed informed consent as described in Appendix 1, which includes compliance with the requirements and restrictions listed in the ICD and in this protocol.

5.2. Exclusion Criteria

Participants are excluded from the study if any of the following criteria apply:

Medical Conditions:

1. History of severe adverse reaction associated with a vaccine and/or severe allergic reaction (eg, anaphylaxis) to any component of the study intervention(s) or any other diphtheria toxoid–containing vaccine.

2. Serious chronic disorder, including metastatic malignancy, severe COPD requiring supplemental oxygen, end-stage renal disease with or without dialysis, cirrhosis of the liver, clinically unstable cardiac disease, or any other disorder that in the investigator's opinion would make the participant inappropriate for entry into the study.

3. History of microbiologically proven invasive disease caused by *S pneumoniae.*

4. Previous clinical or microbiological diagnosis of COVID-19.

5. Known or suspected immunodeficiency (aside from stable HIV meeting inclusion criterion 4) or other conditions associated with immunosuppression, including, but not limited to, immunoglobulin class/subclass deficiencies, generalized malignancy, leukemia, lymphoma, or organ or bone marrow transplant.

6. Bleeding diathesis or condition associated with prolonged bleeding that would, in the opinion of the investigator, contraindicate intramuscular injection.

7. Congenital, functional, or surgical asplenia.

8. Current febrile illness (body temperature ≥100.4°F [≥38.0°C]) or other acute illness within 48 hours before study intervention administration.

9. Other medical or psychiatric condition including recent (within the past year) or active suicidal ideation/behavior or laboratory abnormality that may increase the risk of study participation or, in the investigator's judgment, make the participant inappropriate for the study.

Prior/Concomitant Therapy:

10. Previous vaccination with any investigational pneumococcal vaccine, or planned receipt of any licensed or investigational pneumococcal vaccine through study participation.

11. Previous vaccination with any coronavirus vaccine, other than those received in Study C4591001.

12. Currently receives treatment with immunosuppressive therapy, including cytotoxic agents or systemic corticosteroids, receipt of short-term (<14 days) systemic corticosteroids for treatment of an acute illness in the 28 days before administration of study intervention, or planned receipt through the last blood draw (Visit 2). Inhaled/nebulized, intra-articular, intrabursal, or topical (skin, eyes, or ears) corticosteroids are permitted.

13. Receipt of blood/plasma products, immunoglobulin, or monoclonal antibodies from 60 days before administration of study intervention, or receipt of any passive antibody therapy specific to COVID-19 from 90 days before administration of study intervention, or planned receipt through Visit 2.

14. Receipt of any inactivated or otherwise nonlive vaccine within 14 days or any live vaccine within 28 days before administration of study intervention.

Prior/Concurrent Clinical Study Experience:

15. Participation in other studies involving investigational drugs, investigational vaccines, or investigational devices within 28 days prior to study entry and/or during study participation other than Study C4591001. Participation in purely observational studies is acceptable.

16. Previous participation in studies other than C4591001 involving study intervention containing LNPs.

Diagnostic Assessments:

Not applicable.

Other Exclusions:

17. Investigator site staff or Pfizer/BioNTech employees directly involved in the conduct of the study, site staff otherwise supervised by the investigator, and their respective family members.

5.3. Lifestyle Considerations

5.3.1. Contraception

The investigator or his or her designee, in consultation with the participant, will confirm that the participant has selected an appropriate method of contraception for the individual participant from the permitted list of contraception methods [redacted] and will confirm that the participant has been instructed in its consistent and correct use. At time points indicated in the SoA, the investigator or designee will inform the participant of the need to use acceptable effective contraception consistently and correctly and document the conversation and the participant's affirmation in the participant's chart (participants need to affirm their consistent and correct use of at least 1 of the selected methods of contraception) considering that their risk for pregnancy may have changed since the last visit.

In addition, the investigator or designee will instruct the participant to call immediately if the selected contraception method is discontinued or if pregnancy is known or suspected in the participant or partner.

5.4. Screen Failures

Screen failures are defined as participants who consent to participate in the clinical study but are not subsequently randomly assigned to study intervention/enrolled in the study. A minimal set of screen failure information is required to ensure transparent reporting of screen failure participants to meet the CONSORT publishing requirements and to respond to queries from regulatory authorities. Minimal information includes demography, screen failure details, eligibility criteria, and any SAE.

Individuals who do not meet the criteria for participation in this study (screen failure) may not be rescreened.

5.5. Criteria for Temporarily Delaying Enrollment/Randomization/Administration of Study Intervention

Not applicable.

6. STUDY INTERVENTION(S) AND CONCOMITANT THERAPY

Study intervention is defined as any investigational intervention(s), marketed product(s), placebo, medical device(s), or study procedure(s) intended to be administered to a study participant according to the study protocol.

For the purposes of this protocol, study intervention refers to 20vPnC, BNT162b2, and saline control.

6.1. Study Intervention(s) Administered

Study Interventions(s)			
Intervention Name	20vPnC	BNT162b2 (BNT162 RNA-LNP vaccine utilizing modRNA and encoding the P2 S)	Saline control
Type	Vaccine	Vaccine	Placebo
Dose Formulation	Sterile liquid suspension formulation containing saccharides from pneumococcal serotypes 1, 3, 4, 5, 6A, 6B, 7F, 8, 9V, 10A, 11A, 12F, 14, 15B, 18C, 19A, 19F, 22F, 23F, and 33F individually conjugated to CRM_{197}	modRNA; frozen-liquid	Sterile normal saline solution for injection (0.9% sodium chloride injection)

Study Interventions(s)			
CCI [redacted]	[redacted]	[redacted]	[redacted]
Route of Administration	Intramuscular injection	Intramuscular injection	Intramuscular injection
Sourcing	Provided centrally by the sponsor	Provided centrally by the sponsor	Provided centrally by the sponsor
Packaging and Labeling	Study intervention will be provided in single-use PFSs. Each PFS will be labeled as required per local and legal requirement. Cartons will include a blinded label and a tamper-evident seal.	Study intervention will be provided in glass vials. Each vial will be labeled as required per local and legal requirement. Cartons will include a blinded label and a tamper-evident seal.	Study intervention will be provided in single-use PFSs or glass vials. Each PFS or vial will be labeled as required per local and legal requirement. Cartons will include a blinded label and a tamper-evident seal.

6.1.1. Administration

Participants will receive study intervention at Visit 1 in accordance with the study's SoA.

At Visit 1, participants will receive a single 0.5-mL dose of either 20vPnC or saline injected intramuscularly into the right deltoid, and a single 0.3-mL dose of either BNT162b2 or saline injected intramuscularly into the left deltoid.

All vaccines will be prepared and administered by third-party unblinded site staff member(s) and will be administered to blinded participants. All other study personnel including the PI will be blinded. The unblinded site staff members will not participate in participant assessments.

Standard vaccination practices must be observed and vaccine must not be injected into blood vessels. Appropriate medication and other supportive measures for management of an acute hypersensitivity reaction should be available in accordance with local guidelines for standard immunization practices.

Administration of study interventions should be performed by an appropriately qualified, GCP-trained, and vaccine-experienced member of the study staff (eg, physician, nurse, physician's assistant, nurse practitioner, pharmacist, or medical assistant) as allowed by local, state, and institutional guidance.

Study intervention administration details will be recorded on the CRF.

6.1.2. Medical Devices

In this study, medical devices being deployed are the PFSs containing 20vPnC or saline. Instructions for medical device use are provided in the IP manual.

All medical device deficiencies (including malfunction, use error, and inadequate labeling) shall be documented and reported by the unblinded site staff throughout the clinical investigation (see Section 8.3.9) and appropriately managed by the sponsor.

6.2. Preparation, Handling, Storage, and Accountability

The investigator or an approved representative, eg, pharmacist, will ensure that all study interventions are stored in a secured area with controlled access under required storage conditions and in accordance with applicable regulatory requirements.

Study interventions should be stored in their original containers and in accordance with the labels.

CCI

[redacted]

CCI

[redacted]

6.2.1. Preparation and Dispensing

See the IP manual for instructions on how to prepare the study intervention for administration. Study intervention should be prepared and dispensed by an appropriately qualified and experienced unblinded member of the study staff (eg, physician, nurse, physician's assistant, nurse practitioner, pharmacy assistant/technician, or pharmacist) as allowed by local, state, and institutional guidance. A second unblinded staff member will verify the preparation and dispensing.

CCI

[redacted]

6.3. Measures to Minimize Bias: Randomization and Blinding

As the appearances, storage conditions, preparation methods, and dose volumes of 20vPnC, BNT162b2, and saline are different, the study interventions will be prepared and administered by a designated third-party–unblinded site staff member. All other study personnel, including the PI, and the participant will be blinded. The unblinded site staff member(s) will not participate in participant assessments. See Section 6.3.2 and Section 6.3.3 for more details on blinding of site personnel members and sponsor.

6.3.1. Allocation to Study Intervention

Allocation (randomization) of participants to vaccine groups will proceed through the use of an IRT system (IWR). The site personnel (study coordinator or specified designee) will be required to enter or select information including but not limited to the user's ID and password, the protocol number, and the participant number. The site personnel will then be provided with a study intervention assignment, randomization number, and DU or container number when study intervention is being supplied via the IRT system. The IRT system will provide a confirmation report containing the participant number, randomization number, and DU or container number assigned. The confirmation report must be stored in the site's files.

Study intervention will be administered at the study visits summarized in the SoA.

The study-specific IRT reference manual and IP manual will provide the contact information and further details on the use of the IRT system.

An otherwise uninvolved third party will be responsible for administration of the vaccines. This includes ensuring that there are no differences in time or effort taken to administer the study intervention and no blinded site staff are able to view the administration.

6.3.2. Blinding of Site Personnel

The study staff receiving, storing, dispensing, preparing, and administering the study interventions will be unblinded. All other study and site personnel, including the investigator, investigator staff, and participants, will be blinded to study intervention assignments. In particular, the individuals who evaluate participant safety will be blinded. Additionally, because there are differences in physical appearance, preparation timing, and dose volumes of 20vPnC, BNT162b2, and saline placebo, the study intervention will be prepared and administered in a manner that prevents the study participants from identifying the vaccine group based on the study intervention's appearance. This includes approximate alignment of dose preparation timing for 20vPnC and saline placebo with that of BNT162b2, which requires 30 minutes to thaw. Refer to the IP Manual for additional instructions.

6.3.3. Blinding of the Sponsor

The sponsor staff will be blinded to study intervention allocation CCI [redacted] except for those described below. All laboratory testing personnel performing serology assays will remain blinded to study intervention assigned/received throughout the study. CCI [redacted]

[redacted]

[redacted]

6.3.4. Breaking the Blind

The IRT will be programmed with blind-breaking instructions. In case of an emergency, the investigator has the sole responsibility for determining if unblinding of a participant's vaccine assignment is warranted. Participant safety must always be the first consideration in making such a determination. If the investigator decides that unblinding is warranted, the investigator should make every effort to contact the sponsor prior to unblinding a participant's vaccine assignment unless this could delay further management of the participant. If a participant's vaccine assignment is unblinded, the sponsor must be notified within 24 hours after breaking the blind. The date and reason that the blind was broken must be recorded in the source documentation and CRF.

The study-specific IRT reference manual and IP manual will provide the contact information and further details on the use of the IRT system.

Unblinding to vaccine assignment may be allowed after Visit 2 to facilitate administration of 20vPnC and BNT162b2 after licensure and recommendation as described in Section 4.1.

6.4. Study Intervention Compliance

When participants are dosed at the site, they will receive study intervention directly from the investigator or designee, under medical supervision. The date and time of each dose administered in the clinic will be recorded in the source documents and recorded in the CRF. The dose of study intervention and study participant identification will be confirmed at the time of dosing by a member of the study site staff other than the person administering the study intervention.

6.5. Dose Modification

Not applicable.

6.6. Continued Access to Study Intervention After the End of the Study

No intervention will be provided to study participants at the end of their study participation.

6.7. Treatment of Overdose

For this study, any dose of study intervention greater than 1 dose of each study intervention within a 24-hour time period will be considered an overdose.

There is no specific treatment for an overdose.

In the event of an overdose, the investigator should:

1. Contact the medical monitor within 24 hours.

2. Closely monitor the participant for any AEs/SAEs.

3. Document the quantity of the excess dose as well as the duration of the overdose in the CRF.

4. Overdose is reportable to Pfizer Safety **only when associated with an SAE.**

Decisions regarding dose interruptions or modifications will be made by the investigator in consultation with the medical monitor based on the clinical evaluation of the participant.

6.8. Concomitant Therapy

The name and date of administration of any prior pneumococcal vaccines will be collected and recorded in the CRF. The name(s) and date(s) of administration are to be obtained from sources, such as medical records or vaccination cards.

The date of administration of the 2 doses of BNT162b2 given in Study C4591001 will be collected and recorded in the CRF.

The name and date of administration for all nonstudy vaccinations received from the time of signing of the ICD to Visit 2 will be collected and recorded in the CRF.

Medications taken to treat SAEs from the time of signing of the ICD through Visit 3 will be recorded in the CRF.

6.8.1. Prohibited During the Study

- Receipt of any investigational vaccines, drugs, or medical devices is prohibited during study participation.

- Receipt of nonstudy pneumococcal or coronavirus vaccine is prohibited during study participation.

- Receipt of any other licensed nonstudy vaccine is prohibited until after Visit 2.

- Receipt of blood/plasma products or immunoglobulins is prohibited through Visit 2.

- Receipt of chronic systemic treatment with known immunosuppressant medications or radiotherapy is prohibited through Visit 2.

- Receipt of systemic corticosteroids (≥20 mg/day of prednisone or equivalent) for ≥14 days is prohibited through Visit 2.

- Receipt of prophylactic medications intended to prevent symptoms associated with study intervention is not permitted. However, if a participant is taking a medication for another condition, even if it may have such properties, it should not be withheld prior to study vaccination.

6.8.2. Permitted During the Study

- Prescription and nonprescription medications, vitamins, minerals, and herbal remedies are permitted during participation in the study.

- Antipyretic and other pain medication to treat symptoms following administration of study intervention are permitted during participation in the study.

- Inhaled/nebulized, topical (eg, skin, eyes, or ears), or localized injections of corticosteroids (eg, intraarticular or intrabursal administration) are permitted during study participation.

7. DISCONTINUATION OF STUDY INTERVENTION AND PARTICIPANT DISCONTINUATION/WITHDRAWAL

7.1. Discontinuation of Study Intervention

Since this is a single-dose study, this section is not applicable.

7.2. Participant Discontinuation/Withdrawal From the Study

A participant may withdraw from the study at any time at his/her own request. Reasons for discontinuation from the study include the following:

- Refused further study procedures;

- Lost to follow-up;

- Death;

- Study terminated by sponsor;
- AE;
- Physician decision;
- Pregnancy;
- Protocol deviation;
- Screen failure;
- Participant request;
- Medication error without associated AE;
- No longer meets eligibility criteria;
- Other.

If a participant withdraws from the study, he/she may request destruction of any remaining samples taken and not tested, and the investigator must document any such requests in the site study records and notify the sponsor accordingly.

If the participant withdraws from the study and also withdraws consent (see Section 7.2.1) for disclosure of future information, no further evaluations should be performed and no additional data should be collected. The sponsor may retain and continue to use any data collected before such withdrawal of consent.

7.2.1. Withdrawal of Consent

Participants who request to discontinue receipt of study intervention will remain in the study and must continue to be followed for protocol-specified follow-up procedures. The only exception to this is when a participant specifically withdraws consent for any further contact with him or her or persons previously authorized by the participant to provide this information. Participants should notify the investigator in writing of the decision to withdraw consent from future follow-up, whenever possible. The withdrawal of consent should be explained in detail in the medical records by the investigator, as to whether the withdrawal is only from further receipt of study intervention or also from study procedures and/or postvaccination study follow-up, and entered on the appropriate CRF page. In the event that vital status (whether the participant is alive or dead) is being measured, publicly available information should be used to determine vital status only as appropriately directed in accordance with local law.

7.3. Lost to Follow-Up

A participant will be considered lost to follow-up if he or she repeatedly fails to return for scheduled visits and is unable to be contacted by the study site.

The following actions must be taken if a participant fails to attend a required study visit:

- The site must attempt to contact the participant and reschedule the missed visit as soon as possible. Counsel the participant on the importance of maintaining the assigned visit schedule, and ascertain whether the participant wishes to and/or should continue in the study;

- Before a participant is deemed lost to follow-up, the investigator or designee must make every effort to regain contact with the participant (where possible, 3 telephone calls and, if necessary, a certified letter to the participant's last known mailing address or local equivalent methods). These contact attempts should be documented in the participant's medical record;

- Should the participant continue to be unreachable, he/she will be considered to have withdrawn from the study.

8. STUDY ASSESSMENTS AND PROCEDURES

The investigator (or an appropriate delegate at the investigator site) must obtain a signed and dated ICD before performing any study-specific procedures.

The date of birth will be collected to critically evaluate the immune response and safety profile by age.

Study procedures and their timing are summarized in Section 8.9 of the SoA. Protocol waivers or exemptions are not allowed.

Safety issues should be discussed with the sponsor immediately upon occurrence or awareness to determine whether the participant should continue or discontinue study intervention.

Adherence to the study design requirements, including those specified in Section 4 and the SoA, is essential and required for study conduct.

All screening evaluations must be completed and reviewed to confirm that potential participants meet all eligibility criteria. The investigator will maintain a screening log to record details of all participants screened and to confirm eligibility or record reasons for screening failure, as applicable.

Every effort should be made to ensure that protocol-required tests and procedures are completed as described. However, it is anticipated that from time to time there may be circumstances outside the control of the investigator that may make it unfeasible to perform the test. In these cases, the investigator must take all steps necessary to ensure the safety and well-being of the participant. When a protocol-required test cannot be performed, the investigator will document the reason for the missed test and any corrective and preventive actions that he or she has taken to ensure that required processes are adhered to as soon as possible. The study team must be informed of these incidents in a timely manner.

For samples being collected and shipped, detailed collection, processing, storage, and shipment instructions and contact information will be provided to the investigator site prior to initiation of the study.

The total blood sampling volume for individual participants in this study is approximately 60 mL.

8.1. Efficacy and/or Immunogenicity Assessments

8.1.1. Immunogenicity Assessments

Blood samples (approximately 30 mL) will be collected from all participants at Visits 1 and 2 as specified in the SoA. Sample collection, processing, storage, and shipping information can be found in the ISF or equivalent manual.

Pneumococcal Responses

OPA titers for the 20vPnC serotypes will be measured in sera collected at Visits 1 and 2 from the Coadministration and 20vPnC-only groups. Participants from these 2 groups will be identified by an independent unblinded statistician; CCI [redacted]

BNT162b2 Responses

IgG levels will be measured in the SARS-CoV-2 full-length S-binding assay in sera collected at Visits 1 and 2 from the Coadministration and BNT162b2-only groups. Participants from these 2 groups will be identified by an independent unblinded statistician; additional participants from the 20vPnC-only group may be included in order to maintain the blinding of randomization assignment.

CCI [redacted]

Blood samples taken at Visits 1 and 2 will also be measured for the N-binding antibody and analyzed at a central laboratory.

8.1.2. Biological Samples

Blood samples will be used only for scientific research. Each sample will be labeled with a code so that the laboratory personnel testing the samples will not know the participant's identity. Samples that remain after performing assays outlined in the protocol may be stored by Pfizer. Unless a time limitation is required by local regulations or ethical requirements, the samples will be stored for up to 15 years after the end of the study and then destroyed. [redacted] No testing of the participant's DNA will be performed.

The participant may request that his or her samples, if still identifiable, be destroyed at any time; however, any data already collected from those samples will still be used for this research. The biological samples may be shared with other researchers as long as confidentiality is maintained and no testing of the participant's DNA is performed.

8.2. Safety Assessments

A clinical assessment, including medical history and measurement of oral temperature, will be performed on all participants prior to any vaccination at Visit 1 to determine participant eligibility and to establish a clinical baseline. Significant medical history and significant findings from any physical examination (if performed) will be recorded as medical history in the CRF. Temperature measurement prior to vaccination at Visit 1 will be documented and recorded in the CRF.

The participant will be observed for 30 minutes after vaccination and any reactions occurring during that time will be recorded as AEs.

Prompted e-diary events, including local reactions (redness, swelling, and pain) at each of the sites of injection and systemic events (fever, headache, chills, fatigue, muscle pain, and joint pain) that occur 10 and 7 days, respectively, after vaccination at Visit 1 (where Day 1 is the day of vaccination) are graded as described in Section 8.2.2.1 and Section 8.2.2.2. Information about use of antipyretic/pain medication within 7 days after vaccination at Visit 1 will be collected as described in Section 8.2.2.3. Furthermore, AEs and SAEs will be collected as defined in Section 8.3.

Planned time points for all safety assessments are provided in the SoA. Unscheduled clinical laboratory measurements may be obtained at any time during the study to assess any perceived safety issues.

8.2.1. Participant Electronic Diary

Participants will be asked to monitor and record local reactions and systemic events using an e-diary (in a provisioned device or an application on a personal device). Use of antipyretic/pain medication will also be collected. This allows recording of these assessments only within a fixed time window, thus providing the accurate representation of

the participant's experience. Data reported in the e-diary will be transferred electronically to the e-diary vendor, where they will be available for review by investigators, their appropriately qualified designees, and sponsor staff at all times via an internet-based portal. At intervals agreed to by the vendor and Pfizer, these data will be transferred electronically to Pfizer for analysis and reporting.

The daily e-diary data will not be captured in the CRF. However, if a participant is withdrawn because of prompted events reported in the e-diary, the event(s) should be recorded on the AE page of the CRF, regardless of whether the investigator considers the event(s) to be clinically significant.

The investigator or designee must obtain stop dates for any local reactions and specific systemic events that were ongoing on the last day that the e-diary was completed. The stop dates should be entered in the CRF. Because chronic use of antipyretic/pain medication is very common in this population and is not being used as a surrogate for an adverse sign/symptom, a stop date will not be sought if antipyretic/pain medication use is present on the last day that the e-diary was completed.

Investigators (or an appropriately qualified designee) are required to review the e-diary data online at frequent intervals (daily is optimal) to evaluate participant compliance and reported events as part of the ongoing safety review.

8.2.2. Grading Scale for Prompted Events

The grading scales used in this study to assess prompted events as described below are based on concepts outlined in the FDA CBER guidelines on toxicity grading scales for healthy adult volunteers enrolled in preventive vaccine clinical trials.[73]

8.2.2.1. Local Reactions

For the first 10 days following vaccination at Visit 1 (Days 1 through 10, where Day 1 is the day of vaccination), the participants will be asked to assess redness, swelling, and pain at each injection site and to record the symptoms in the e-diary in the evening. Separate e-diary entries will be captured for local reactions occurring at the left and right arm injection sites. Redness and swelling will be measured and recorded in measuring device (caliper) units (range: 1 to 21+) and then categorized during analysis as mild, moderate, or severe based on the grading scale in Table 1. Measuring device units can be converted to centimeters according to the following scale: 1 measuring device unit = 0.5 cm. Pain at the vaccine injection site will be assessed by the participant as mild, moderate, or severe according to the grading scale in Table 1. The participant will be prompted to contact the investigator if he/she experiences a severe (Grade 3 or above) local reaction to assess the reaction and perform an unscheduled assessment or visit as appropriate.

Only an investigator is able to classify a participant's local reaction as Grade 4, after physical examination of the participant or documentation from another medically qualified source (eg, emergency room or hospital record). If a participant experiences a Grade 4 local

reaction, the investigator must immediately notify the sponsor. Site staff will educate the participants regarding signs and symptoms that would prompt site contact. Grade 4 reactions will be collected as an AE on the CRF. The event will be graded using the AE severity grading scale (Section 10.3.3).

The procedure for notification of the sponsor is provided in the ISF or equivalent.

Table 1. Grading Scales for Local Reactions

	Mild Grade 1	Moderate Grade 2	Severe Grade 3[a]	Grade 4[b]
Redness	5 to 10 measuring device units = >2.0 to 5.0 cm	11 to 20 measuring device units = >5.0 to 10.0 cm	>20 measuring device units = >10.0 cm	Necrosis or exfoliative dermatitis
Swelling	5 to 10 measuring device units = >2.0 to 5.0 cm	11 to 20 measuring device units = >5.0 to 10.0 cm	>20 measuring device units = >10.0 cm	Necrosis
Pain at injection site	Does not interfere with activity	Interferes with activity	Prevents daily activity[c]	Emergency room visit or hospitalization for severe injection site pain

Abbreviations: CRF = case report form; e-diary = electronic diary.
Note: If the size of the redness and/or swelling falls between 2 measuring device units, the higher measuring device unit number will be recorded in the e-diary.

a. Participants experiencing Grade 3 local reactions are required to contact the investigator site. In the event that the participant does not call, the investigator will call the participant.
b. Grade 4 assessment should be made by the investigator; Grade 4 local reactions will not be collected in the e-diary but will be collected as AEs on the CRF. The severity of the local reaction should be graded using the AE severity grading scale in Section 10.3.3.
c. Prevents daily activity, eg, results in missed days of work or is otherwise incapacitating.

8.2.2.2. Systemic Events – Systemic Symptoms and Fever

From Day 1 through Day 7 following vaccination at Visit 1, where Day 1 is the day of vaccination, participants will be asked to assess headache, fatigue, chills, muscle pain, and joint pain and to record the symptoms in the e-diary in the evening. The symptoms will be assessed by the participant as mild, moderate, or severe according to the grading scale in Table 2 below. Participants will also be instructed to contact site staff or the investigator if they experience any severe (Grade 3 or above) prompted systemic event within 7 days after vaccination. Study staff may also contact the participant to obtain additional information on Grade 3 events entered into the e-diary.

Only an investigator is able to classify a participant's systemic event as Grade 4, after physical examination of the participant or documentation from another medically qualified source (eg, emergency room or hospital record) or telephone contact with the participant. If a participant experiences a Grade 4 systemic event, the investigator must immediately notify the sponsor. Grade 4 events will be collected as an AE on the CRF. The event will be graded using the AE severity grading scale (See Section 10.3.3).

The procedure for notification of the sponsor is provided in the ISF or equivalent.

Table 2. Grading Scales for Systemic Events

	Mild Grade 1	Moderate Grade 2	Severe Grade 3[a]	Grade 4[b]
Fatigue (tiredness)	Does not interfere with activity	Some interference with activity	Prevents daily routine activity	Emergency room visit or hospitalization for severe fatigue
Headache	Does not interfere with activity	Some interference with activity	Prevents daily routine activity	Emergency room visit or hospitalization for severe headache
Chills	Does not interfere with activity	Some interference with activity	Prevents daily routine activity	Emergency room visit or hospitalization for severe chills
Muscle pain	Does not interfere with activity	Some interference with activity	Prevents daily routine activity	Emergency room visit or hospitalization for severe muscle pain
Joint pain	Does not interfere with activity	Some interference with activity	Prevents daily routine activity	Emergency room visit or hospitalization for severe joint pain

Abbreviations: CRF = case report form; e-diary = electronic diary.

a. Prevents daily routine activity, eg, results in missed days of work or is otherwise incapacitating; includes use of narcotics for analgesia.
b. Grade 4 assessment should be made by the investigator; Grade 4 systemic events will not be collected in the e-diary but will be collected as AEs on the CRF. The severity of the systemic event should be graded using the AE severity grading scale in Section 10.3.3.

8.2.2.2.1. Fever

In order to record information on fever, a digital thermometer will be given to the participant with instructions on how to measure oral temperature at home. Temperature will be collected in the evening daily for 7 days following vaccination at Visit 1 (Days 1 through 7, where Day 1 is the day of vaccination) and at any time during the 7 days that fever is

suspected. Fever is defined as an oral temperature of ≥100.4°F (≥38.0°C). The highest temperature for each day will be recorded in the e-diary. In the event of a fever on Day 7, temperature will be collected daily until the fever has resolved (1 day of temperature <100.4°F [<38.0°C]) in order to collect a stop date in the CRF. Participants reporting a fever >102.0°F (>38.9°C) will be prompted to contact the study site. Study staff may also contact the participant to obtain additional information if a temperature of >102.0°F (>38.9°C) is entered into an e-diary. Temperature will be measured and recorded to 1 decimal place.

Temperatures reported in degrees Fahrenheit will be programmatically converted to degrees Celsius for reporting. Fever will be grouped into ranges for the analysis according to Table 3.

Table 3. Ranges for Fever

38.0°C to 38.4°C
>38.4°C to 38.9°C
>38.9°C to 40.0°C[a]
>40.0°C[a]

Note: Fever is defined as a temperature of ≥38.0°C.
a. Participants reporting a fever >38.9°C will be prompted to contact the study site.

8.2.2.3. Use of Antipyretic/Pain Medication

The participant will be asked to record the use of antipyretic/pain medication (yes/no) in the e-diary in the evening, daily, for 7 days following vaccination at Visit 1 (Days 1 through 7, where Day 1 is the day of vaccination). Antipyretic/pain medication includes chronic use of NSAIDs; however, use of low-dose aspirin (<325 mg) should not be recorded in the e-diary.

8.2.3. Clinical Safety Laboratory Assessments

Clinical safety laboratory assessments will not be collected in this study.

8.3. Adverse Events, Serious Adverse Events, and Other Safety Reporting

The definitions of an AE and an SAE can be found in Appendix 3.

The definitions of device-related safety events (ADEs and SADEs) can be found in Appendix 6. Device deficiencies are covered in Section 8.3.9.

AEs may arise from symptoms or other complaints reported to the investigator by the participant (or, when appropriate, by a caregiver, surrogate, or the participant's legally authorized representative), or they may arise from clinical findings of the investigator or other healthcare providers (clinical signs, test results, etc).

The investigator and any qualified designees are responsible for detecting, documenting, and recording events that meet the definition of an AE or SAE and remain responsible to pursue and obtain adequate information both to determine the outcome and to assess whether the

event meets the criteria for classification as an SAE or caused the participant to discontinue the study intervention (see Section 7.1).

During the active collection period as described in Section 8.3.1, each participant will be questioned about the occurrence of AEs in a nonleading manner.

In addition, the investigator may be requested by Pfizer Safety to obtain specific follow-up information in an expedited fashion.

8.3.1. Time Period and Frequency for Collecting AE and SAE Information

The time period for actively eliciting and collecting AEs and SAEs ("active collection period") for each participant begins from the time the participant provides informed consent, which is obtained before the participant's participation in the study (ie, before undergoing any study-related procedure and/or receiving study intervention), through and including Visit 2. At Month 6 (Visit 3), all participants will be contacted by telephone to inquire about SAEs, including hospitalizations, and medications to treat SAEs since the last visit. Since participation in Study C4591001 for safety follow-up may be ongoing for participants in this study, safety events relevant to both protocols will be reported as applicable.

Follow-up by the investigator continues throughout and after the active collection period and until the AE or SAE or its sequelae resolve or stabilize at a level acceptable to the investigator.

For participants who are screen failures, the active collection period ends when screen failure status is determined.

If the participant withdraws from the study and also withdraws consent for the collection of future information, the active collection period ends when consent is withdrawn.

If a participant permanently discontinues or temporarily discontinues study because of an AE or SAE, the AE or SAE must be recorded on the CRF and the SAE reported using the Vaccine SAE Reporting Form.

Investigators are not obligated to actively seek information on AEs or SAEs after the participant has concluded study participation. However, if the investigator learns of any SAE, including a death, at any time after a participant has completed the study, and he/she considers the event to be reasonably related to the study intervention, the investigator must promptly report the SAE to Pfizer using the Vaccine SAE Reporting Form.

8.3.1.1. Reporting SAEs to Pfizer Safety

All SAEs occurring in a participant during the active collection period as described in Section 8.3.1 are reported to Pfizer Safety on the Vaccine SAE Reporting Form immediately upon awareness and under no circumstance should this exceed 24 hours, as indicated in

Appendix 3. The investigator will submit any updated SAE data to the sponsor within 24 hours of it being available.

8.3.1.2. Recording Nonserious AEs and SAEs on the CRF

All nonserious AEs and SAEs occurring in a participant during the active collection period, which begins after obtaining informed consent as described in Section 8.3.1, will be recorded on the AE section of the CRF.

The investigator is to record on the CRF all directly observed and all spontaneously reported AEs and SAEs reported by the participant.

8.3.2. Method of Detecting AEs and SAEs

The method of recording, evaluating, and assessing causality of AEs and SAEs and the procedures for completing and transmitting SAE reports are provided in Appendix 3.

Care will be taken not to introduce bias when detecting AEs and/or SAEs. Open-ended and nonleading verbal questioning of the participant is the preferred method to inquire about AE occurrences.

8.3.3. Follow-Up of AEs and SAEs

After the initial AE or SAE report, the investigator is required to proactively follow each participant at subsequent visits/contacts. For each event, the investigator must pursue and obtain adequate information until resolution, stabilization, the event is otherwise explained, or the participant is lost to follow-up (as defined in Section 7.3).

In general, follow-up information will include a description of the event in sufficient detail to allow for a complete medical assessment of the case and independent determination of possible causality. Any information relevant to the event, such as concomitant medications and illnesses, must be provided. In the case of a participant death, a summary of available autopsy findings must be submitted as soon as possible to Pfizer Safety.

Further information on follow-up procedures is given in Appendix 3.

8.3.4. Regulatory Reporting Requirements for SAEs

Prompt notification by the investigator to the sponsor of an SAE is essential so that legal obligations and ethical responsibilities toward the safety of participants and the safety of a study intervention under clinical investigation are met.

The sponsor has a legal responsibility to notify both the local regulatory authority and other regulatory agencies about the safety of a study intervention under clinical investigation. The sponsor will comply with country-specific regulatory requirements relating to safety reporting to the regulatory authority, IRBs/ECs, and investigators.

Investigator safety reports must be prepared for SUSARs according to local regulatory requirements and sponsor policy and forwarded to investigators as necessary.

An investigator who receives SUSARs or other specific safety information (eg, summary or listing of SAEs) from the sponsor will review and then file it along with the SRSD(s) for the study and will notify the IRB/EC, if appropriate according to local requirements.

8.3.5. Environmental Exposure, Exposure During Pregnancy or Breastfeeding, and Occupational Exposure

Environmental exposure occurs when a person not enrolled in the study as a participant receives unplanned direct contact with or exposure to the study intervention. Such exposure may or may not lead to the occurrence of an AE or SAE. Persons at risk for environmental exposure include healthcare providers, family members, and others who may be exposed. An environmental exposure may include exposure during pregnancy, exposure during breastfeeding, and occupational exposure.

Any such exposure to the study intervention under study are reportable to Pfizer Safety within 24 hours of investigator awareness.

8.3.5.1. Exposure During Pregnancy

An EDP occurs if:

- A female participant is found to be pregnant while receiving or after discontinuing study intervention.
- A male participant who is receiving or has discontinued study intervention exposes a female partner prior to or around the time of conception.
- A female is found to be pregnant while being exposed or having been exposed to study intervention due to environmental exposure. Below are examples of environmental EDP:
    - A female family member or healthcare provider reports that she is pregnant after having been exposed to the study intervention by injection, inhalation, or skin contact.
    - A male family member or healthcare provider who has been exposed to the study intervention by injection, inhalation, or skin contact then exposes his female partner prior to or around the time of conception.

The investigator must report EDP to Pfizer Safety within 24 hours of the investigator's awareness, irrespective of whether an SAE has occurred. The initial information submitted should include the anticipated date of delivery (see below for information related to termination of pregnancy).

- If EDP occurs in a participant or a participant's partner, the investigator must report this information to Pfizer Safety on the Vaccine SAE Reporting Form and an EDP Supplemental Form, regardless of whether an SAE has occurred. Details of the pregnancy will be collected after the start of study intervention and until the final telephone contact.

- If EDP occurs in the setting of environmental exposure, the investigator must report information to Pfizer Safety using the Vaccine SAE Reporting Form and EDP Supplemental Form. Since the exposure information does not pertain to the participant enrolled in the study, the information is not recorded on a CRF; however, a copy of the completed Vaccine SAE Reporting Form is maintained in the investigator site file.

Follow-up is conducted to obtain general information on the pregnancy and its outcome for all EDP reports with an unknown outcome. The investigator will follow the pregnancy until completion (or until pregnancy termination) and notify Pfizer Safety of the outcome as a follow-up to the initial EDP Supplemental Form. In the case of a live birth, the structural integrity of the neonate can be assessed at the time of birth. In the event of a termination, the reason(s) for termination should be specified and, if clinically possible, the structural integrity of the terminated fetus should be assessed by gross visual inspection (unless preprocedure test findings are conclusive for a congenital anomaly and the findings are reported).

Abnormal pregnancy outcomes are considered SAEs. If the outcome of the pregnancy meets the criteria for an SAE (ie, ectopic pregnancy, spontaneous abortion, intrauterine fetal demise, neonatal death, or congenital anomaly), the investigator should follow the procedures for reporting SAEs. Additional information about pregnancy outcomes that are reported to Pfizer Safety as SAEs follows:

- Spontaneous abortion including miscarriage and missed abortion;

- Neonatal deaths that occur within 1 month of birth should be reported, without regard to causality, as SAEs. In addition, infant deaths after 1 month should be reported as SAEs when the investigator assesses the infant death as related or possibly related to exposure to the study intervention.

Additional information regarding the EDP may be requested by the sponsor. Further follow-up of birth outcomes will be handled on a case-by-case basis (eg, follow-up on preterm infants to identify developmental delays). In the case of paternal exposure, the investigator will provide the participant with the Pregnant Partner Release of Information Form to deliver to his partner. The investigator must document in the source documents that the participant was given the Pregnant Partner Release of Information Form to provide to his partner.

8.3.5.2. Exposure During Breastfeeding

An exposure during breastfeeding occurs if:

- A female participant is found to be breastfeeding while receiving or after discontinuing study intervention.

- A female is found to be breastfeeding while being exposed or having been exposed to study intervention (ie, environmental exposure). An example of environmental exposure during breastfeeding is a female family member or healthcare provider who reports that she is breastfeeding after having been exposed to the study intervention by injection, inhalation, or skin contact.

The investigator must report exposure during breastfeeding to Pfizer Safety within 24 hours of the investigator's awareness, irrespective of whether an SAE has occurred. The information must be reported using the Vaccine SAE Reporting Form. When exposure during breastfeeding occurs in the setting of environmental exposure, the exposure information does not pertain to the participant enrolled in the study**,** so the information is not recorded on a CRF. However, a copy of the completed Vaccine SAE Reporting Form is maintained in the investigator site file.

An exposure during breastfeeding report is not created when a Pfizer drug specifically approved for use in breastfeeding women (eg, vitamins) is administered in accord with authorized use. However, if the infant experiences an SAE associated with such a drug, the SAE is reported together with the exposure during breastfeeding.

8.3.5.3. Occupational Exposure

The investigator must report any instance of occupational exposure to Pfizer Safety within 24 hours of the investigator's awareness using the Vaccine SAE Reporting Form, regardless of whether there is an associated SAE. Since the information about the occupational exposure does not pertain to a participant enrolled in the study, the information is not recorded on a CRF; however, a copy of the completed Vaccine SAE Reporting Form must be maintained in the ISF.

8.3.6. Cardiovascular and Death Events

Not applicable.

8.3.7. Disease-Related Events and/or Disease-Related Outcomes Not Qualifying as AEs or SAEs

Not applicable.

8.3.8. Adverse Events of Special Interest

Not applicable. However, although there are no AESIs for the B7471026 protocol, an unplanned potential COVID-19 illness visit and unplanned potential COVID-19 convalescent visit are required in the C4591001 protocol (see the C4591001 protocol for details).

8.3.8.1. Lack of Efficacy

The investigator must report signs, symptoms, and/or clinical sequelae resulting from lack of efficacy. Lack of efficacy or failure of expected pharmacological action is reportable to Pfizer Safety **only if associated with an SAE**.

8.3.9. Medical Device Deficiencies

Medical devices being provided for use in this study as the study intervention are supplied in PFSs. In order to fulfill regulatory reporting obligations worldwide, the unblinded site staff is responsible for the detection and documentation of events meeting the definitions of device deficiency that occur during the study with such devices.

The definition of a medical device deficiency can be found in Appendix 6.

Note: AEs and/or SAEs that are associated with a medical device deficiency will follow the same processes as other AEs or SAEs, as outlined in Sections 8.3.1 through 8.3.4 and Appendix 3 of the protocol.

8.3.9.1. Time Period for Detecting Medical Device Deficiencies

Medical device deficiencies that result in an incident will be detected, documented, and reported during all periods of the study in which the medical device is used.

Importantly, reportable device deficiencies are not limited to problems with the device itself but also include incorrect or improper use of the device and even intentional misuse, etc.

If the unblinded site staff learns of any device deficiency at any time after a participant has been discharged from the study, and such deficiency is considered reasonably related to a medical device provided for the study, the unblinded site staff will promptly notify the sponsor.

The method of documenting medical device deficiencies is provided in Appendix 6.

8.3.9.2. Follow-Up of Medical Device Deficiencies

Follow-up applies to all participants, including those who discontinue study intervention.

The unblinded site staff is responsible for ensuring that follow-up includes any supplemental investigations as indicated to elucidate the nature and/or causality of the deficiency.

New or updated information will be recorded on a follow-up form with all changes signed and dated by the unblinded site staff.

8.3.9.3. Prompt Reporting of Device Deficiencies to the Sponsor

When a device deficiency occurs:

1. The unblinded site staff notifies the sponsor by telephone within 1 business day of determining that the incident meets the protocol definition of a medical device deficiency.

2. The device deficiency must be recorded on the Medical Device Complaint form.

3. If an AE (either serious or non-serious) associated with the device deficiency occurs, then the AE must be entered into the AE section of the CRF.

4. If an SAE associated with the device deficiency is brought to the attention of the unblinded site staff, the unblinded site staff must immediately notify Pfizer Safety of the SAE (see Section 8.3.1.1). All relevant details related to the role of the device in the event must be included in the Vaccine SAE Reporting Form as outlined in Sections 8.3.1.1 and 8.3.1.2.

The sponsor will be the contact for the receipt of device deficiency information.

8.3.9.4. Regulatory Reporting Requirements for Device Deficiencies

The unblinded site staff will promptly report all device deficiencies occurring with any medical device provided for use in the study in order for the sponsor to fulfill the legal responsibility to notify appropriate regulatory authorities and other entities about certain safety information relating to medical devices being used in clinical studies.

The unblinded site staff, or responsible person according to local requirements (eg, the head of the medical institution), will comply with the applicable local regulatory requirements relating to the reporting of device deficiencies to the IRB/EC.

8.3.10. Medication Errors

Medication errors may result from the administration or consumption of the study intervention by the wrong participant, or at the wrong time, or at the wrong dosage strength.

Exposures to the study intervention under study may occur in clinical trial settings, such as medication errors.

Safety Event	Recorded on the CRF	Reported on the Vaccine SAE Reporting Form to Pfizer Safety Within 24 Hours of Awareness
Medication errors	All (regardless of whether associated with an AE)	Only if associated with an SAE

Medication errors include:

- Medication errors involving participant exposure to the study intervention;
- Potential medication errors or uses outside of what is foreseen in the protocol that do or do not involve the study participant.

Other examples include, but are not limited to:

- The administration of expired study intervention;
- The administration of an incorrect study intervention;
- The administration of an incorrect dosage;
- The administration of study intervention that has undergone temperature excursion from the specified storage range, unless it is determined by the sponsor that the study intervention under question is acceptable for use.

Such medication errors occurring to a study participant are to be captured on the medication error page of the CRF, which is a specific version of the AE page.

In the event of a medication dosing error, the sponsor should be notified within 24 hours.

Whether or not the medication error is accompanied by an AE, as determined by the investigator, the medication error is recorded on the medication error page of the CRF and, if applicable, any associated AE(s), serious and nonserious, are recorded on the AE page of the CRF.

Medication errors should be reported to Pfizer Safety within 24 hours on a Vaccine SAE Reporting Form **only when associated with an SAE.**

8.4. Pharmacokinetics

Pharmacokinetic parameters are not evaluated in this study.

CCI [redacted]

CCI [redacted]

[redacted]

8.7. Immunogenicity Assessments

Immunogenicity assessments are described in Section 8.1.

8.8. Health Economics

Health economics/medical resource utilization and health economics parameters are not evaluated in this study.

8.9. Study Procedures

The study procedures are summarized in the SoA. The day of vaccination is considered to be Day 1. The timing of visit procedures (ie, prior to vaccination and after vaccination) must be maintained; however, there is flexibility in the order in which the procedures can be conducted at each visit. The only exception is that at Visit 1, the ICD must be signed prior to the start of any study procedure.

8.9.1. Visit 1 (Day 1)

Prior to randomization:

- Obtain a personally signed and dated ICD indicating that the participant has been informed of all pertinent aspects of the study before performing any study-specific procedures.
- Assign a participant number via the IRT.
- Obtain and record the participant number assigned to the participant in Study C4591001.
- Obtain and record the participant's demographic information (including date of birth, sex, race, and ethnicity). The complete date of birth (ie, DD-MMM-YYYY) will be collected to critically evaluate the immune response and safety profile by age.
- Obtain and record significant interim medical history, defined as significant medical history occurring since enrollment in Study C4591001, including COVID-19 infection, the presence of chronic conditions (eg, diabetes, asthma, cardiac disease, COPD), and/or medical history of significance, such as relevant surgical procedures. Please note that although significant medical history previously recorded in C4591001 will not need to be recorded again in this study, significant medical history will be reviewed to verify and confirm eligibility in this study.

- Perform a clinical assessment. If the clinical assessment indicates that a physical examination is necessary to comprehensively evaluate the participant, perform a physical examination and record any findings in the source documents and, if significant, record such findings on the medical history CRF.

- Assess and record smoking history.

- Measure and record the participant's height and weight.

- Measure and record the participant's oral temperature (°F/°C).

- Record pneumococcal vaccine history, including name(s) of the vaccine(s) received and date(s) given (dates may be approximate but minimally sufficient to confirm eligibility and appropriate stratification).

- Record the dates of the BNT162b2 vaccinations received in Study C4591001 and ensure at least 6 months have passed since the second vaccination.

- If applicable, instruct the participant to use appropriate contraceptives until 28 days after administration of the last dose of study intervention, and document the conversation and the participant's affirmation in the participant's source document (see Section 5.3.1).

- Ensure and document that all of the inclusion criteria and none of the exclusion criteria are met. This includes a review of the participant's medical history as recorded in Study C4591001.

- Assign a randomization number and a study intervention container number via the IRT. This must be the last step before proceeding. An unblinded site staff member will prepare the study intervention according to the IP manual.

After randomization:

- Collect a blood sample of approximately 30 mL prior to vaccination for immunogenicity assessments and to test for prior COVID-19. Please refer to the ISF for further instructions.

- A designated third-party–unblinded site staff member will prepare the study interventions for administration in a manner that prevents the study participants from identifying the study intervention group based on preparation time prior to administration. This includes approximate alignment of dose preparation timing for 20vPnC and saline placebo with that of BNT162b2, which requires 30 minutes to thaw. Refer to the IP manual for further instructions.

- An unblinded site staff member will administer a single 0.5-mL injection of **20vPnC** or **saline** into the deltoid muscle of the **right** arm. Please refer to the IP manual for further instructions.

- An unblinded site staff member will administer a single 0.3-mL injection of **BNT162b2 or saline** into the deltoid muscle of the **left** arm. Please refer to the IP manual for further instructions.

- Blinded site staff will observe the participant for 30 minutes after administration of study intervention for any reactions. Record any acute reactions (including time of onset) in the participant's source documents and on the AE page of the CRF, and on the Vaccine SAE Reporting Form as applicable. Record concomitant medications used to treat SAEs.

- Record AEs and SAEs as described in Section 8.3.

- Issue the participant a measuring device to measure injection site reactions and a digital thermometer and provide instructions on their use. Separate e-diary entries will be captured for local reactions occurring at the left and right arm injection sites.

- Explain the e-diary technologies available for this study (Section 8.2.1), and assist the participant in downloading the study application onto the participant's own device or issue a provisioned device, if required. Provide instructions on the e-diary's use and completion and ask the participant to complete the e-diary from Day 1 through Day 10, with Day 1 being the day of vaccination.

- Ask the participant to contact the investigator site staff or investigator as soon as possible during the 10-day postvaccination period if the participant has redness and/or swelling at the left or right arm injection site measuring >20 measuring device units (>10 cm), or severe right or left arm injection site pain (prevents daily activity) to determine if an unscheduled reactogenicity visit is required (refer to Section 8.9.4).

- Ask the participant to contact the investigator site staff or investigator as soon as possible if he or she experiences fever ≥39.0°C (≥102.1°F) or any severe systemic event from Day 1 to Day 7 after vaccination (where Day 1 is the day of vaccination) to determine if an unscheduled reactogenicity visit is required (see Section 8.9.4).

- Ask the participant to contact the site staff or investigator immediately if any significant illness or medical event (eg, emergency room visit or hospitalization) occurs.

- Provide the participant with the participant contact card containing the study and investigator information (see Section 10.1.11).

- Inform the participant that he or she may be contacted by site staff to obtain additional information on reports of fever >102.0°F (>38.9°C) or Grade 3 events entered into the e-diary.

- Remind the participant to use appropriate contraceptives until 28 days after the last study vaccination, if applicable.
- Schedule an appointment for the participant to return for the next study visit.
- Remind the participant to bring the reactogenicity e-diary to the next visit.
- The investigator or an authorized designee completes the CRF and the source documents and updates the study intervention accountability records.
- The investigator or appropriately qualified designee reviews the e-diary data online at frequent intervals (daily is optimal) for the 10 days (Day 1 is the day of vaccination) following vaccination to evaluate participant compliance and as part of the ongoing safety review.

8.9.2. Visit 2 (21 to 35 Days After Visit 1)

- Ensure and document that the participant continues to be eligible for the study (see Section 7 for participant discontinuation/withdrawal).
- Record nonstudy vaccinations as described in Section 6.8.
- Discuss contraceptive use [redacted] if applicable.
- Review the participant's e-diary data. Collect stop dates of any e-diary events (local reactions or systemic events) ongoing on the last day that the e-diary was completed and record stop dates in the CRF.
- Collect the participant's reactogenicity e-diary or assist the participant to remove the study application from his or her own personal device.
- Determine if any AEs (includes nonserious AEs and SAEs) have occurred since the previous visit, follow up on any previously reported events to determine the outcome (ie, record stop dates or confirm if they are still continuing), record as described in Section 8.3, and record concomitant medications used to treat SAEs.
- Collect a blood sample of approximately 30 mL for immunogenicity assessments.
- Ask the participant to contact the site staff or investigator immediately if any significant illness or medical event (eg, emergency room visit or hospitalization) occurs.
- Schedule an appointment for the participant to be contacted by telephone for the next study visit.
- The investigator or an authorized designee completes the CRF and the source documents.

8.9.3. Visit 3 (6 Months [168 to 196 Days] After Visit 1)

- Contact the participant by telephone approximately 6 months after study vaccination; this contact should be attempted for all participants who have received study vaccination, unless the participant has withdrawn consent for this.

- Determine whether any SAEs have occurred since the previous visit, follow up on any previously reported events to determine the outcome (ie, record stop dates or confirm if they are still continuing), record as described in Section 8.3, and record concomitant medications used to treat SAEs.

- The investigator or an authorized designee completed the CRF and the source documents.

8.9.4. Unscheduled Visits

If the participant reports redness or swelling at the injection site measuring >20 measuring device units (>10.0 cm) or severe injection site pain (Section 8.2.2.1) during the 10 days following vaccination at Visit 1, or a severe systemic event (Section 8.2.2.2) during the 7 days following vaccination at Visit 1, a telephone contact must occur as soon as possible between the investigator or medically qualified designee and the participant to assess if an unscheduled investigator site visit is required. A site visit should be scheduled as soon as possible to assess the extent of the injection site reaction unless any of the following is true:

- The participant is unable to attend the unscheduled visit.

- The reaction is no longer present at the time of the telephone contact.

- The participant recorded an incorrect value in the e-diary (confirmation of an e-diary data entry error).

- The PI or authorized designee determined it was not needed.

This telephone contact will be recorded in the participant's source documentation and the CRF.

If the participant is unable to attend the unscheduled visit, or the PI or authorized designee determined it was not needed, any ongoing reactions must be assessed at the next study visit.

During the unscheduled visit, the reactions should be assessed by the investigator or a medically qualified member of the study staff, such as a study physician or a study nurse, as applicable to the investigator's local practice, who will:

- Measure oral temperature (°F/°C).

- Measure minimum and maximum diameters of redness (if present).

- Measure minimum and maximum diameters of swelling (if present).
- Assess injection site pain (if present) in accordance with the grades provided in Section 8.2.2.1.
- Assess systemic events (if present) in accordance with the grades provided in Section 8.2.2.2.
- Assess for other findings associated with the reaction and record on the AE page of the CRF, if appropriate.

The investigator or an authorized designee will complete the unscheduled visit assessment page of the CRF.

9. STATISTICAL CONSIDERATIONS

Methodology for summary and statistical analyses of the data collected in this study is described here and further detailed in a SAP, which will be maintained by the sponsor. The SAP may modify what is outlined in the protocol where appropriate; however, any major modifications of the primary endpoint definitions or their analyses will also be reflected in a protocol amendment.

9.1. Statistical Hypotheses

9.1.1. Estimands

The estimand corresponding to each primary (for safety) or secondary (for immunogenicity) objective is described in the table in Section 3. In the primary safety objective evaluations, missing e-diary data will not be imputed. A partial AE start date (missing day, missing both month and day) will be imputed by assigning the earliest possible start date using all available information, such as the stop date of the AE and the vaccination date(s) from the same participant, following the Pfizer standard of handling incomplete AE start date. An AE with a completely missing start date is not allowed in the data collection. No other missing information will be imputed in the safety analysis.

The estimand to evaluate each immunogenicity objective will be based on the evaluable immunogenicity population (Section 9.2). The estimand estimates the vaccine effect in the hypothetical setting where participants follow the study schedules and protocol requirements as directed. Missing serology results will not be imputed. Immunogenicity results that are below the LLOQ will be set to 0.5 × LLOQ in the analysis.

9.2. Analysis Sets

For purposes of analysis, the following analysis sets are defined:

Participant Analysis Set	Description
Enrolled	All participants who have a signed ICD.
Randomized	All participants who are assigned a randomization number in the IWR system.
Evaluable immunogenicity	All eligible randomized participants who receive the study intervention(s) as assigned at Visit 1, have at least 1 valid immunogenicity result from the blood sample collected within an appropriate window approximately 1 month after vaccination (Visit 2), and have no other major protocol deviations as determined by the clinician. In the analysis for BNT162b2 immunogenicity endpoints based on the evaluable immunogenicity population, data from participants with clinically documented SARS-CoV-2 infection occurring between vaccination and 1 month after vaccination may be excluded. Participants will be grouped according to the vaccine as randomized in the analysis based on the evaluable immunogenicity population.
CCI [redacted]	[redacted]
Safety	All participants who receive at least 1 dose of the study intervention and have safety follow up after vaccination. Participants will be analyzed according to the vaccine as administered in the analysis based on the safety population.

9.3. Statistical Analyses

The SAP will be developed and finalized before any unblinded analyses are performed and will describe the analyses and procedures for accounting for missing, unused, and spurious data. This section is a summary of the planned statistical analyses of the primary and secondary endpoints.

9.3.1. General Considerations

9.3.1.1. Analysis for Binary Data

Descriptive statistics for categorical variables (eg, proportions) are the percentage (%), the numerator (n) and the denominator (N) used in the percentage calculation, and the 2-sided 95% CIs where applicable.

The exact 95% CI for binary endpoints for each group will be computed using the F distribution (Clopper-Pearson).

For the between-group difference, the 2-sided 95% CI will be calculated using the Miettinen and Nurminen method.[74]

9.3.1.2. Analysis for Continuous Data

Unless otherwise stated, descriptive statistics for continuous variables are n, mean, median, standard deviation, minimum, and maximum.

9.3.1.2.1. Geometric Mean

The geometric mean for each vaccine group will be calculated as the mean of the logarithmically transformed assay results and then exponentiating the mean. The 2-sided 95% CI will be obtained by exponentiating the limits of the CI for the mean of the logarithmically transformed assay results based on Student's t-distribution.

9.3.1.2.2. Geometric Mean Fold Rise

The GMFR for each vaccine group is defined as the geometric mean of the fold rises in the assay results from before to approximately 1 month after vaccination. Only data from participants with nonmissing assay results at both time points will be included in the GMFR calculation.

GMFR will be calculated as the mean difference of logarithmically transformed assay results (1 month after vaccination – before vaccination) and exponentiating the mean difference. The 2-sided 95% CI will be obtained by exponentiating the limits of the CI for the mean difference of the logarithmically transformed assay results based on Student's t-distribution.

CCI

[redacted]

9.3.2. Primary Endpoint(s)/Estimand(s) Analysis

Objectives	Endpoint and Estimand	Statistics & Hypothesis Test
Safety	• Proportions of participants with local reactions (redness, swelling, and pain at the injection site) within 10 days after vaccination at each injection site in each vaccine group • Proportions of participants with systemic events (fever, headache, chills, fatigue, muscle pain, and joint pain) within 7 days after vaccination in each vaccine group	• Descriptive summary statistics for participants with each local reaction/systemic event within 10/7 days after vaccination by maximum severity cumulatively across severity levels
	• AEs and SAEs from vaccination through approximately 1 month after vaccination	• Descriptive summary statistics
	• SAEs from vaccination to 6 months after vaccination	• Descriptive summary statistics

9.3.3. Secondary Endpoint(s)/Estimand(s) Analysis

Objectives	Endpoint and Estimand	Statistics & Hypothesis Test
Immunogenicity	• OPA GMTs for the 20vPnC serotypes at approximately 1 month after vaccination in each vaccine group	• GMT and 2-sided 95% CI
	• GMCs of full-length S-binding IgG levels at approximately 1 month after vaccination in each vaccine group	• GMC and 2-sided 95% CI
	• GMFR of full-length S-binding IgG levels from before to approximately 1 month after vaccination in each vaccine group	• GMFR and 2-sided 95% CI

CCI

[redacted]

9.4. Interim Analyses

No formal interim analysis will be conducted for this study.

CCI

[redacted]

9.5. Sample Size Determination

The sample size of the study is determined primarily based on considerations of accumulating an informative overall safety and immunogenicity data for coadministration considerations. With 200 participants in each vaccine group, there is a greater than 86% chance of observing at least 1 AE in each group if the true rate is at least 1% (Table 4).

Table 4. Probability of Detecting at Least 1 AE

Sample Size	True Rate of AEs	Probability of Observing at Least 1 AE
200	0.5%	63.3%
	1.0%	86.6%
	1.5%	95.1%

10. SUPPORTING DOCUMENTATION AND OPERATIONAL CONSIDERATIONS

10.1. Appendix 1: Regulatory, Ethical, and Study Oversight Considerations

10.1.1. Regulatory and Ethical Considerations

This study will be conducted in accordance with the protocol and with the following:

- Consensus ethical principles derived from international guidelines, including the Declaration of Helsinki and CIOMS International Ethical Guidelines;
- Applicable ICH GCP guidelines;
- Applicable laws and regulations, including applicable privacy laws.

The protocol, protocol amendments, ICD, SRSD(s), and other relevant documents (eg, advertisements) must be reviewed and approved by the sponsor, submitted to an IRB/EC by the investigator, and reviewed and approved by the IRB/EC before the study is initiated.

Any amendments to the protocol will require IRB/EC approval before implementation of changes made to the study design, except for changes necessary to eliminate an immediate hazard to study participants.

Protocols and any substantial amendments to the protocol will require health authority approval prior to initiation except for changes necessary to eliminate an immediate hazard to study participants.

The investigator will be responsible for the following:

- Providing written summaries of the status of the study to the IRB/EC annually or more frequently in accordance with the requirements, policies, and procedures established by the IRB/EC;
- Notifying the IRB/EC of SAEs or other significant safety findings as required by IRB/EC procedures;
- Providing oversight of the conduct of the study at the site and adherence to requirements of 21 CFR, ICH GCP guidelines, the IRB/EC, European regulation 536/2014 for clinical studies (if applicable), European Medical Device Regulation 2017/745 for clinical device research (if applicable), and all other applicable local regulations.

10.1.1.1. Reporting of Safety Issues and Serious Breaches of the Protocol or ICH GCP

In the event of any prohibition or restriction imposed (ie, clinical hold) by an applicable regulatory authority in any area of the world, or if the investigator is aware of any new information that might influence the evaluation of the benefits and risks of the study intervention, Pfizer should be informed immediately.

In addition, the investigator will inform Pfizer immediately of any urgent safety measures taken by the investigator to protect the study participants against any immediate hazard, and of any serious breaches of this protocol or of the ICH GCP guidelines that the investigator becomes aware of.

10.1.2. Financial Disclosure

Investigators and subinvestigators will provide the sponsor with sufficient, accurate financial information as requested to allow the sponsor to submit complete and accurate financial certification or disclosure statements to the appropriate regulatory authorities. Investigators are responsible for providing information on financial interests during the course of the study and for 1 year after completion of the study.

10.1.3. Informed Consent Process

The investigator or his/her representative will explain the nature of the study, including the risks and benefits, to the participant and answer all questions regarding the study. The participant should be given sufficient time and opportunity to ask questions and to decide whether or not to participate in the trial.

Participants must be informed that their participation is voluntary. Participants will be required to sign a statement of informed consent that meets the requirements of 21 CFR 50, local regulations, ICH guidelines, privacy and data protection requirements, where applicable, and the IRB/EC or study center.

The investigator must ensure that each study participant is fully informed about the nature and objectives of the study, the sharing of data related to the study, and possible risks associated with participation, including the risks associated with the processing of the participant's personal data.

The participant must be informed that his/her personal study-related data will be used by the sponsor in accordance with local data protection law. The level of disclosure must also be explained to the participant.

The participant must be informed that his/her medical records may be examined by Clinical Quality Assurance auditors or other authorized personnel appointed by the sponsor, by appropriate IRB/EC members, and by inspectors from regulatory authorities.

The investigator further must ensure that each study participant is fully informed about his or her right to access and correct his or her personal data and to withdraw consent for the processing of his or her personal data.

The medical record must include a statement that written informed consent was obtained before the participant was enrolled in the study and the date on which the written consent was obtained. The authorized person obtaining the informed consent must also sign the ICD.

Participants must be reconsented to the most current version of the ICD(s) during their participation in the study.

A copy of the ICD(s) must be provided to the participant.

10.1.4. Data Protection

All parties will comply with all applicable laws, including laws regarding the implementation of organizational and technical measures to ensure protection of participant data.

Participants' personal data will be stored at the study site in encrypted electronic and/or paper form and will be password-protected or secured in a locked room to ensure that only authorized study staff have access. The study site will implement appropriate technical and organizational measures to ensure that the personal data can be recovered in the event of disaster. In the event of a potential personal data breach, the study site will be responsible for determining whether a personal data breach has in fact occurred and, if so, providing breach notifications as required by law.

To protect the rights and freedoms of participants with regard to the processing of personal data, participants will be assigned a single, participant-specific numerical code. Any participant records or data sets that are transferred to the sponsor will contain the numerical code; participant names will not be transferred. All other identifiable data transferred to the sponsor will be identified by this single, participant-specific code. The study site will maintain a confidential list of participants who participated in the study, linking each participant's numerical code to his or her actual identity and medical record ID. In case of data transfer, the sponsor will protect the confidentiality of participants' personal data consistent with the clinical study agreement and applicable privacy laws.

CCI [redacted]

CCI [redacted]

10.1.6. Dissemination of Clinical Study Data

Pfizer fulfills its commitment to publicly disclose clinical study results through posting the results of studies on www.clinicaltrials.gov (ClinicalTrials.gov), the EudraCT, and/or www.pfizer.com, and other public registries in accordance with applicable local

laws/regulations. In addition, Pfizer reports study results outside of the requirements of local laws/regulations pursuant to its SOPs.

In all cases, study results are reported by Pfizer in an objective, accurate, balanced, and complete manner and are reported regardless of the outcome of the study or the country in which the study was conducted.

www.clinicaltrials.gov

Pfizer posts clinical trial results on www.clinicaltrials.gov for Pfizer-sponsored interventional studies (conducted in patients) that evaluate the safety and/or efficacy of a product, regardless of the geographical location in which the study is conducted. These results are submitted for posting in accordance with the format and timelines set forth by US law.

EudraCT

Pfizer posts clinical trial results on EudraCT for Pfizer-sponsored interventional studies in accordance with the format and timelines set forth by EU requirements.

www.pfizer.com

Pfizer posts public disclosure synopses (CSR synopses in which any data that could be used to identify individual participants have been removed) on www.pfizer.com for Pfizer-sponsored interventional studies at the same time the corresponding study results are posted to www.clinicaltrials.gov.

Documents within marketing authorization packages/submissions

Pfizer complies with the European Union Policy 0070, the proactive publication of clinical data to the EMA website. Clinical data, under Phase 1 of this policy, includes clinical overviews, clinical summaries, CSRs, and appendices containing the protocol and protocol amendments, sample CRFs, and statistical methods. Clinical data, under Phase 2 of this policy, includes the publishing of individual participant data. Policy 0070 applies to new marketing authorization applications submitted via the centralized procedure since 01 January 2015 and applications for line extensions and for new indications submitted via the centralized procedure since 01 July 2015.

Data sharing

Pfizer provides researchers secure access to patient-level data or full CSRs for the purposes of "bona-fide scientific research" that contributes to the scientific understanding of the disease, target, or compound class. Pfizer will make data from these trials available 24 months after study completion. Patient-level data will be anonymized in accordance with applicable privacy laws and regulations. CSRs will have personally identifiable information redacted.

Data requests are considered from qualified researchers with the appropriate competencies to perform the proposed analyses. Research teams must include a biostatistician. Data will not be provided to applicants with significant conflicts of interest, including individuals requesting access for commercial/competitive or legal purposes.

10.1.7. Data Quality Assurance

All participant data relating to the study will be recorded on printed or electronic CRF unless transmitted to the sponsor or designee electronically (eg, laboratory data). The investigator is responsible for verifying that data entries are accurate and correct by physically or electronically signing the CRF.

Guidance on completion of CRFs will be provided in the CRF Completion Requirements document.

The investigator must ensure that the CRFs are securely stored at the study site in encrypted electronic and/or paper form and are password protected or secured in a locked room to prevent access by unauthorized third parties.

QTLs are predefined parameters that are monitored during the study. Important deviations from the QTLs and any remedial actions taken will be summarized in the clinical study report.

The investigator must permit study-related monitoring, audits, IRB/EC review, and regulatory agency inspections and provide direct access to source data documents. This verification may also occur after study completion. It is important that the investigator(s) and their relevant personnel are available during the monitoring visits and possible audits or inspections and that sufficient time is devoted to the process.

Monitoring details describing strategy, including definition of study critical data items and processes (eg, risk-based initiatives in operations and quality such as risk management and mitigation strategies and analytical risk-based monitoring), methods, responsibilities, and requirements, including handling of noncompliance issues and monitoring techniques (central, virtual, or on-site monitoring), are provided in the data management plan and monitoring plan maintained and utilized by the sponsor or designee.

The sponsor or designee is responsible for the data management of this study, including quality checking of the data.

Records and documents, including signed ICDs, pertaining to the conduct of this study must be retained by the investigator for 15 years after study completion unless local regulations or institutional policies require a longer retention period. No records may be destroyed during the retention period without the written approval of the sponsor. No records may be transferred to another location or party without written notification to the sponsor. The investigator must ensure that the records continue to be stored securely for as long as they are maintained.

When participant data are to be deleted, the investigator will ensure that all copies of such data are promptly and irrevocably deleted from all systems.

The investigator(s) will notify the sponsor or its agents immediately of any regulatory retain notification in relation to the study. Furthermore, the investigator will cooperate with the sponsor or its agents to prepare the investigator site for the inspection and will allow the sponsor or its agent, whenever feasible, to be present during the inspection. The investigator site and investigator will promptly resolve any discrepancies that are identified between the study data and the participant's medical records. The investigator will promptly provide copies of the inspection findings to the sponsor or its agent. Before response submission to the regulatory authorities, the investigator will provide the sponsor or its agents with an opportunity to review and comment on responses to any such findings.

10.1.8. Source Documents

Source documents provide evidence for the existence of the participant and substantiate the integrity of the data collected. Source documents are filed at the investigator site.

Data reported on the CRF or entered in the eCRF that are from source documents must be consistent with the source documents or the discrepancies must be explained. The investigator may need to request previous medical records or transfer records, depending on the study. Also, current medical records must be available.

Definition of what constitutes source data and its origin can be found in the ISF, which is maintained by the sponsor.

Description of the use of the computerized system is documented in the Data Management Plan, which is maintained by the sponsor.

The investigator must maintain accurate documentation (source data) that supports the information entered in the CRF.

Study monitors will perform ongoing source data verification to confirm that data entered into the CRF by authorized site personnel are accurate, complete, and verifiable from source documents; that the safety and rights of participants are being protected; and that the study is being conducted in accordance with the currently approved protocol and any other study agreements, ICH GCP guidelines, and all applicable regulatory requirements.

10.1.9. Study and Site Start and Closure

The study start date is the date on which the clinical study will be open for recruitment of participants.

The first act of recruitment is the date of the first participant’s first visit and will be the study start date.

The sponsor designee reserves the right to close the study site or terminate the study at any time for any reason at the sole discretion of the sponsor. Study sites will be closed upon study completion. A study site is considered closed when all required documents and study supplies have been collected and a study-site closure visit has been performed.

The investigator may initiate study-site closure at any time upon notification to the sponsor or designee/CRO if requested to do so by the responsible IRB/EC or if such termination is required to protect the health of study participants.

Reasons for the early closure of a study site by the sponsor may include but are not limited to:

- Failure of the investigator to comply with the protocol, the requirements of the IRB/EC or local health authorities, the sponsor's procedures, or the ICH GCP guidelines;
- Inadequate recruitment of participants by the investigator;
- Discontinuation of further study intervention development.

If the study is prematurely terminated or suspended, the sponsor shall promptly inform the investigators, the ECs/IRBs, the regulatory authorities, and any CRO(s) used in the study of the reason for termination or suspension, as specified by the applicable regulatory requirements. The investigator shall promptly inform the participant and should assure appropriate participant therapy and/or follow-up.

Study termination is also provided for in the clinical study agreement. If there is any conflict between the contract and this protocol, the contract will control as to termination rights.

10.1.10. Publication Policy

The results of this study may be published or presented at scientific meetings by the investigator after publication of the overall study results or 1 year after the end of the study (or study termination), whichever comes first.

The investigator agrees to refer to the primary publication in any subsequent publications, such as secondary manuscripts, and submits all manuscripts or abstracts to the sponsor 30 days before submission. This allows the sponsor to protect proprietary information and to provide comments, and the investigator will, on request, remove any previously undisclosed confidential information before disclosure, except for any study- or Pfizer intervention-related information necessary for the appropriate scientific presentation or understanding of the study results.

For all publications relating to the study, the investigator will comply with recognized ethical standards concerning publications and authorship, including those established by the International Committee of Medical Journal Editors.

The sponsor will comply with the requirements for publication of the overall study results covering all investigator sites. In accordance with standard editorial and ethical practice, the sponsor will support publication of multicenter studies only in their entirety and not as individual site data. In this case, a coordinating investigator will be designated by mutual agreement.

Authorship of publications for the overall study results will be determined by mutual agreement and in line with International Committee of Medical Journal Editors authorship requirements.

If publication is addressed in the clinical study agreement, the publication policy set out in this section will not apply.

10.1.11. Sponsor's Qualified Medical Personnel

The contact information for the sponsor's appropriately qualified medical personnel for the study is documented in the study contact list located in the supporting study documentation/study portal or other electronic system.

To facilitate access to appropriately qualified medical personnel for study-related medical questions or problems, participants are provided with an Emergency Contact Card (ECC) at the time of informed consent. The ECC contains, at a minimum, (a) protocol and study intervention identifiers, (b) participant's study identification number, (c) site emergency phone number active 24 hours/day, 7 days per week, and (d) Pfizer Call Center number.

The ECC is intended to augment, not replace, the established communication pathways between the investigator, site staff, and study team. The ECC is to be used by healthcare professionals not involved in the research study only, as a means of reaching the investigator or site staff related to the care of a participant. The Pfizer Call Center number should only be used when the investigator and site staff cannot be reached. The Pfizer Call Center number is not intended for use by the participant directly; if a participant calls that number directly, he or she will be directed back to the investigator site.

10.2. Appendix 2: Clinical Laboratory Tests

Unscheduled clinical laboratory measurements may be obtained at any time during the study to assess any perceived safety issues. Investigators must document their review of each laboratory safety report.

10.3. Appendix 3: Adverse Events: Definitions and Procedures for Recording, Evaluating, Follow-Up, and Reporting

10.3.1. Definition of AE

AE Definition
• An AE is any untoward medical occurrence in a patient or clinical study participant, temporally associated with the use of study intervention, whether or not considered related to the study intervention. • Note: An AE can therefore be any unfavorable and unintended sign (including an abnormal laboratory finding), symptom, or disease (new or exacerbated) temporally associated with the use of study intervention.

Events <u>Meeting</u> the AE Definition

• Any abnormal laboratory test results (hematology, clinical chemistry, or urinalysis) or other safety assessments (eg, ECG, radiological scans, vital sign measurements), including those that worsen from baseline, considered clinically significant in the medical and scientific judgment of the investigator. Any abnormal laboratory test results that meet any of the conditions below must be recorded as an AE:
 	
  • Is associated with accompanying symptoms.
 	
  • Requires additional diagnostic testing or medical/surgical intervention.
 	
  • Leads to a change in study dosing (outside of any protocol-specified dose adjustments) or discontinuation from the study, significant additional concomitant drug treatment, or other therapy.
 	
• Exacerbation of a chronic or intermittent preexisting condition, including either an increase in frequency and/or intensity of the condition.
 	
• New condition detected or diagnosed after study intervention administration, even though it may have been present before the start of the study.
 	
• Signs, symptoms, or the clinical sequelae of a suspected drug-drug interaction.
 	
• Signs, symptoms, or the clinical sequelae of a suspected overdose of either study intervention or a concomitant medication. Overdose per se will not be reported as an AE or SAE unless it is an intentional overdose taken with possible

suicidal/self-harming intent. Such overdoses should be reported regardless of sequelae.

Events NOT Meeting the AE Definition

- Any clinically significant abnormal laboratory findings or other abnormal safety assessments that are associated with the underlying disease, unless judged by the investigator to be more severe than expected for the participant's condition.
- The disease/disorder being studied or expected progression, signs, or symptoms of the disease/disorder being studied, unless more severe than expected for the participant's condition.
- Medical or surgical procedure (eg, endoscopy, appendectomy): the condition that leads to the procedure is the AE.
- Situations in which an untoward medical occurrence did not occur (social and/or convenience admission to a hospital).
- Anticipated day-to-day fluctuations of preexisting disease(s) or condition(s) present or detected at the start of the study that do not worsen.

10.3.2. Definition of an SAE

An SAE is defined as any untoward medical occurrence that, at any dose, meets one or more of the criteria listed below:

a. Results in death

b. Is life-threatening

The term "life-threatening" in the definition of "serious" refers to an event in which the participant was at risk of death at the time of the event. It does not refer to an event that hypothetically might have caused death if it were more severe.

c. Requires inpatient hospitalization or prolongation of existing hospitalization

In general, hospitalization signifies that the participant has been admitted (usually involving at least an overnight stay) at the hospital or emergency ward for observation and/or treatment that would not have been appropriate in the physician's office or outpatient setting. Complications that occur during hospitalization are AEs. If a

complication prolongs hospitalization or fulfills any other serious criteria, the event is serious. When in doubt as to whether "hospitalization" occurred or was necessary, the AE should be considered serious.

Hospitalization for elective treatment of a preexisting condition that did not worsen from baseline is not considered an AE.

d. Results in persistent or significant disability/incapacity

- The term disability means a substantial disruption of a person's ability to conduct normal life functions.
- This definition is not intended to include experiences of relatively minor medical significance, such as uncomplicated headache, nausea, vomiting, diarrhea, influenza, and accidental trauma (eg, sprained ankle), that may interfere with or prevent everyday life functions but do not constitute a substantial disruption.

e. Is a congenital anomaly/birth defect

f. Is a suspected transmission via a Pfizer product of an infectious agent, pathogenic or non-pathogenic, is considered serious.

The event may be suspected from clinical symptoms or laboratory findings indicating an infection in a participant exposed to a Pfizer product. The terms "suspected transmission" and "transmission" are considered synonymous. These cases are considered unexpected and handled as serious expedited cases by pharmacovigilance personnel. Such cases are also considered for reporting as product defects, if appropriate.

g. Other situations:

- Medical or scientific judgment should be exercised by the investigator in deciding whether SAE reporting is appropriate in other situations, such as significant medical events that may jeopardize the participant or may require medical or surgical intervention to prevent one of the other outcomes listed in the above definition. These events should usually be considered serious.
- Examples of such events include invasive or malignant cancers, intensive treatment in an emergency room or at home for allergic bronchospasm, blood dyscrasias or convulsions that do not result in hospitalization, or development of drug dependency or drug abuse.

10.3.3. Recording/Reporting and Follow-Up of AEs and/or SAEs During the Active Collection Period

AE and SAE Recording/Reporting

The table below summarizes the requirements for recording AEs on the CRF and for reporting SAEs on the Vaccine SAE Reporting Form to Pfizer Safety throughout the active collection period. These requirements are delineated for 3 types of events: (1) SAEs; (2) nonserious AEs; and (3) exposure to the study intervention under study during pregnancy or breastfeeding, and occupational exposure.

It should be noted that the Vaccine SAE Reporting Form for reporting of SAE information is not the same as the AE page of the CRF. When the same data are collected, the forms must be completed in a consistent manner. AEs should be recorded using concise medical terminology and the same AE term should be used on both the CRF and the Vaccine SAE Reporting Form for reporting of SAE information.

Safety Event	**Recorded on the CRF**	**Reported on the Vaccine SAE Reporting Form to Pfizer Safety Within 24 Hours of Awareness**
SAE	All	All
Nonserious AE	All	None
Exposure to the study intervention under study during pregnancy or breastfeeding,	All AEs or SAEs associated with exposure during pregnancy or breastfeeding **Note:** Instances of EDP or EDB not associated with an AE or SAE are not captured in the CRF.	All instances of EDP are reported (whether or not there is an associated SAE)* All instances of EDB are reported (whether or not there is an associated SAE). **
Environmental or occupational exposure to the product under study to a non-participant (not involving EDP or EDB).	None. Exposure to a study non-participant is not collected on the CRF.	The exposure (whether or not there is an associated AE or SAE) must be reported.***

* **EDP** (with or without an associated AE or SAE): any pregnancy information is reported to Pfizer Safety using Vaccine SAE Reporting Form and EDP Supplemental Form; if the EDP is associated with an SAE, then the SAE is reported to Pfizer Safety using the Vaccine SAE Reporting Form.

** **EDB** is reported to Pfizer Safety using the Vaccine SAE Reporting Form which would also include details of any SAE that might be associated with the EDB.

*** **Environmental or Occupational exposure:** AEs or SAEs associated with occupational exposure are reported to Pfizer Safety using the Vaccine SAE Reporting Form.

- When an AE or SAE occurs, it is the responsibility of the investigator to review all documentation (eg, hospital progress notes, laboratory reports, and diagnostic reports) related to the event.
- The investigator will then record all relevant AE or SAE information in the CRF.
- It is **not** acceptable for the investigator to send photocopies of the participant's medical records to Pfizer Safety in lieu of completion of the Vaccine SAE Reporting Form/AE or SAE CRF page.
- There may be instances when copies of medical records for certain cases are requested by Pfizer Safety. In this case, all participant identifiers, with the exception of the participant number, will be redacted on the copies of the medical records before submission to Pfizer Safety.
- The investigator will attempt to establish a diagnosis of the event based on signs, symptoms, and/or other clinical information. Whenever possible, the diagnosis (not the individual signs/symptoms) will be documented as the AE or SAE.

Assessment of Intensity

The investigator will make an assessment of intensity for each AE and SAE reported during the study and assign it to 1 of the following categories:

GRADE	If required on the AE page of the CRF, the investigator will use the adjectives MILD, MODERATE, or SEVERE to describe the maximum intensity of the AE. For purposes of consistency, these intensity grades are defined as follows:	
1	MILD	Does not interfere with participant's usual function.
2	MODERATE	Interferes to some extent with participant's usual function.
3	SEVERE	Interferes significantly with participant's usual function.

Assessment of Causality

- The investigator is obligated to assess the relationship between study intervention and each occurrence of each AE or SAE. The investigator will use clinical judgment to determine the relationship.

- A "reasonable possibility" of a relationship conveys that there are facts, evidence, and/or arguments to suggest a causal relationship, rather than a relationship cannot be ruled out.

- Alternative causes, such as underlying disease(s), concomitant therapy, and other risk factors, as well as the temporal relationship of the event to study intervention administration, will be considered and investigated.

- The investigator will also consult the IB and/or product information, for marketed products, in his/her assessment.

- For each AE or SAE, the investigator **must** document in the medical notes that he/she has reviewed the AE or SAE and has provided an assessment of causality.

- There may be situations in which an SAE has occurred and the investigator has minimal information to include in the initial report to the sponsor. However, **it is very important that the investigator always make an assessment of causality for every event before the initial transmission of the SAE data to the sponsor.**

- The investigator may change his/her opinion of causality in light of follow-up information and send an SAE follow-up report with the updated causality assessment.

- The causality assessment is one of the criteria used when determining regulatory reporting requirements.

- If the investigator does not know whether or not the study intervention caused the event, then the event will be handled as "related to study intervention" for reporting purposes, as defined by the sponsor. In addition, if the investigator determines that an SAE is associated with study procedures, the investigator must record this causal relationship in the source documents and CRF, and report such an assessment in the dedicated section of the Vaccine SAE Reporting Form and in accordance with the SAE reporting requirements.

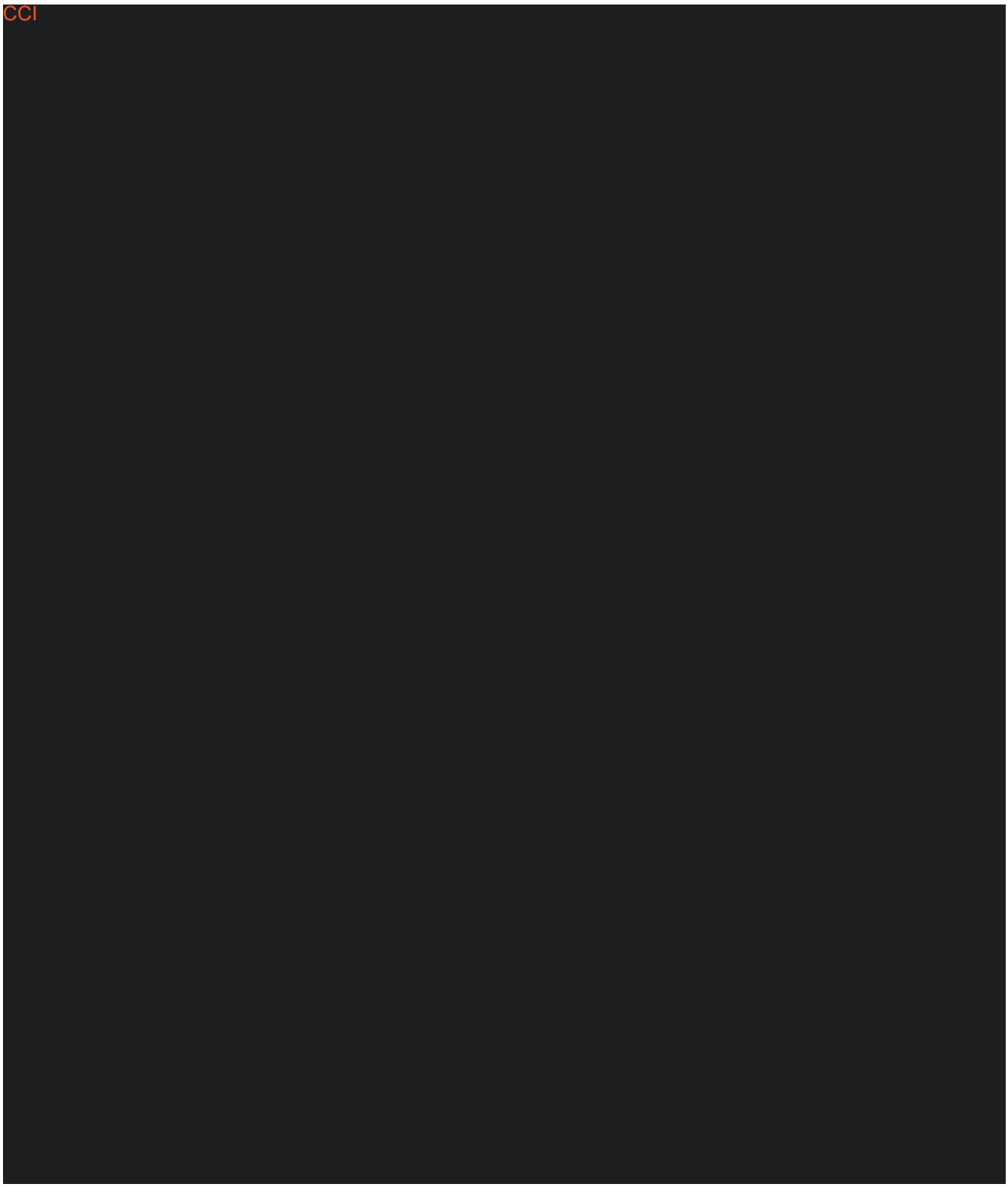
Follow-Up of AEs and SAEs
• The investigator is obligated to perform or arrange for the conduct of supplemental measurements and/or evaluations, as medically indicated or as requested by the sponsor, to elucidate the nature and/or causality of the AE or SAE as fully as possible. This may include additional laboratory tests or investigations, histopathological examinations, or consultation with other healthcare providers. • If a participant dies during participation in the study or during a recognized follow-up period, the investigator will provide Pfizer Safety with a copy of any postmortem findings, including histopathology. • New or updated information will be recorded in the originally submitted documents. • The investigator will submit any updated SAE data to the sponsor within 24 hours of receipt of the information.

10.3.4. Reporting of SAEs

SAE Reporting to Pfizer Safety via an Electronic Data Collection Tool
• The primary mechanism for reporting an SAE to Pfizer Safety will be the electronic data collection tool. • If the electronic system is unavailable, then the site will use the paper SAE data collection tool (see next section) to report the event within 24 hours. • The site will enter the SAE data into the electronic system as soon as the data become available. • After the study is completed at a given site, the electronic data collection tool will be taken off-line to prevent the entry of new data or changes to existing data. • If a site receives a report of a new SAE from a study participant or receives updated data on a previously reported SAE after the electronic data collection tool has been taken off-line, then the site can report this information on a paper SAE form (see next section) or to Pfizer Safety by telephone.

SAE Reporting to Pfizer Safety via Vaccine SAE Reporting Form

- Facsimile transmission of the Vaccine SAE Reporting Form is the preferred method to transmit this information to Pfizer Safety.
- In circumstances when the facsimile is not working, notification by telephone is acceptable with a copy of the Vaccine SAE Reporting Form sent by overnight mail or courier service.
- Initial notification via telephone does not replace the need for the investigator to complete and sign the Vaccine SAE Reporting Form pages within the designated reporting time frames.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10.5. Appendix 5: Liver Safety: Suggested Actions and Follow-Up Assessments

Potential Cases of Drug-Induced Liver Injury

Humans exposed to a drug who show no sign of liver injury (as determined by elevations in transaminases) are termed "tolerators," while those who show transient liver injury but adapt are termed "adaptors." In some participants, transaminase elevations are a harbinger of a more serious potential outcome. These participants fail to adapt and therefore are "susceptible" to progressive and serious liver injury, commonly referred to as DILI. Participants who experience a transaminase elevation above 3 × ULN should be monitored more frequently to determine if they are "adaptors" or are "susceptible."

LFTs are not required as a routine safety monitoring procedure in this study. However, should an investigator deem it necessary to assess LFTs because a participant presents with clinical signs/symptoms, such LFT results should be managed and followed as described below.

In the majority of DILI cases, elevations in AST and/or ALT precede TBili elevations (>2 × ULN) by several days or weeks. The increase in TBili typically occurs while AST/ALT is/are still elevated above 3 × ULN (ie, AST/ALT and TBili values will be elevated within the same laboratory sample). In rare instances, by the time TBili elevations are detected, AST/ALT values might have decreased. This occurrence is still regarded as a potential DILI. Therefore, abnormal elevations in either AST OR ALT in addition to TBili that meet the criteria outlined below are considered potential DILI (assessed per Hy's law criteria) cases and should always be considered important medical events, even before all other possible causes of liver injury have been excluded.

The threshold of laboratory abnormalities for a potential DILI case depends on the participant's individual baseline values and underlying conditions. Participants who present with the following laboratory abnormalities should be evaluated further as potential DILI (Hy's law) cases to definitively determine the etiology of the abnormal laboratory values:

- Participants with AST/ALT and TBili baseline values within the normal range who subsequently present with AST OR ALT values >3 × ULN AND a TBili value >2 × ULN with no evidence of hemolysis and an alkaline phosphatase value <2 × ULN or not available.

- For participants with baseline AST **OR** ALT **OR** TBili values above the ULN, the following threshold values are used in the definition mentioned above, as needed, depending on which values are above the ULN at baseline:

    - Preexisting AST or ALT baseline values above the normal range: AST or ALT values >2 times the baseline values AND >3 × ULN; or >8 × ULN (whichever is smaller).

- Preexisting values of TBili above the normal range: TBili level increased from baseline value by an amount of at least 1 × ULN **or** if the value reaches >3 × ULN (whichever is smaller).

Rises in AST/ALT and TBili separated by more than a few weeks should be assessed individually based on clinical judgment; any case where uncertainty remains as to whether it represents a potential Hy's law case should be reviewed with the sponsor.

The participant should return to the investigator site and be evaluated as soon as possible, preferably within 48 hours from awareness of the abnormal results. This evaluation should include laboratory tests, detailed history, and physical assessment.

In addition to repeating measurements of AST and ALT and TBili for suspected Hy's law cases, additional laboratory tests should include albumin, CK, direct and indirect bilirubin, GGT, PT/INR, total bile acids, and alkaline phosphatase. Consideration should also be given to drawing a separate tube of clotted blood and an anticoagulated tube of blood for further testing, as needed, for further contemporaneous analyses at the time of the recognized initial abnormalities to determine etiology. A detailed history, including relevant information, such as review of ethanol, acetaminophen/paracetamol (either by itself or as a coformulated product in prescription or over-the-counter medications), recreational drug, or supplement (herbal) use and consumption, family history, sexual history, travel history, history of contact with a jaundiced person, surgery, blood transfusion, history of liver or allergic disease, and potential occupational exposure to chemicals, should be collected. Further testing for acute hepatitis A, B, C, D, and E infection, liver imaging (eg, biliary tract), and collection of serum samples for acetaminophen/paracetamol drug and/or protein adduct levels may be warranted.

All cases demonstrated on repeat testing as meeting the laboratory criteria of AST/ALT and TBili elevation defined above should be considered potential DILI (Hy's law) cases if no other reason for the LFT abnormalities has yet been found. **Such potential DILI (Hy's law) cases are to be reported as SAEs, irrespective of availability of all the results of the investigations performed to determine etiology of the LFT abnormalities.**

A potential DILI (Hy's law) case becomes a confirmed case only after all results of reasonable investigations have been received and have excluded an alternative etiology.

10.6. Appendix 6: AEs, ADEs, SAEs, SADEs, USADEs, and Device Deficiencies: Definitions and Procedures for Recording, Evaluating, Follow-Up, and Reporting in Medical Device Studies

Definitions of a Medical Device Deficiency

The definitions and procedures detailed in this appendix are in accordance with ISO 14155 and the European MDR 2017/745 for clinical device research (if applicable).

Both the investigator and the sponsor will comply with all local reporting requirements for medical devices.

The detection and documentation procedures described in this protocol apply to all sponsor medical devices provided for use in the study (see Section 6.1.2 for the list of sponsor medical devices).

10.6.1. Definition of AE and ADE

AE and ADE Definition
• An AE is defined in Appendix 3 (Section 10.3.1). • An ADE is defined as an AE related to the use of an investigational medical device. This definition includes any AEs resulting from insufficient or inadequate instructions for use, deployment, implantation, installation, or operation, or any malfunction of the investigational medical device as well as any event resulting from use error or from intentional misuse of the investigational medical device.

10.6.2. Definition of SAE, SADE, and USADE

SAE Definition
• An SAE is defined in Appendix 3 (Section 10.3.2).
SADE Definition
• An SADE is defined as an adverse device effect that has resulted in any of the consequences characteristic of an SAE. • Any device deficiency that might have led to an SAE if appropriate action had not been taken, intervention had not occurred, or circumstances had been less fortunate.

USADE Definition
• A USADE is a serious adverse device effect that by its nature, incidence, severity, or outcome has not been identified in the current version of the risk analysis management file.

10.6.3. Definition of Device Deficiency

Device Deficiency Definition
• A device deficiency is an inadequacy of a medical device with respect to its identity, quality, durability, reliability, safety, or performance. Device deficiencies include malfunctions, use errors, and inadequate information supplied by the manufacturer.

10.6.4. Recording/Reporting and Follow-Up of Medical Device Deficiencies

Device Deficiency Recording
• When a device deficiency occurs, it is the responsibility of the unblinded site staff to review all documentation (eg, hospital progress notes, laboratory reports, and diagnostic reports) related to the event. • The unblinded site staff will then record all relevant device deficiency information in the participant's medical records, in accordance with the investigator's normal clinical practice and will also capture the required information on the Medical Device Complaint form. • It is **not** acceptable for the investigator to send photocopies of the participant's medical records to Pfizer Safety in lieu of following the reporting process described in the Medical Device Complaint form. • There may be instances when copies of medical records for certain cases are requested by Pfizer Safety. In this case, all participant identifiers, with the exception of the participant number, will be redacted on the copies of the medical records before submission to Pfizer Safety. • If the unblinded site staff determines that the medical device deficiency may have injured the participant (ie, the medical device deficiency is associated with an AE or SAE), then the unblinded site staff will attempt to establish a diagnosis of the event based on signs, symptoms, and/or other clinical information. Whenever possible, the diagnosis will be documented in the participant's medical record and recorded as the AE or SAE rather than the individual signs/symptoms.

Requirements for recording and reporting an AE or SAE are provided in Appendix 3 (Section 10.3.3).

- For device deficiencies, it is very important that the unblinded site staff describes any corrective or remedial actions taken to prevent recurrence of the incident.
  - A remedial action is any action other than routine maintenance or servicing of a medical device where such action is necessary to prevent recurrence of a device deficiency. This includes any amendment to the device design to prevent recurrence.

Assessment of Causality Occurring in Conjunction With a Medical Device Deficiency

- If an AE or SAE has occurred in conjunction with a medical device deficiency, the investigator must assess the relationship between each occurrence of the AE or SAE and the medical device deficiency. The investigator will use clinical judgment to determine the relationship.
- A "reasonable possibility" of a relationship conveys that there are facts, evidence, and/or arguments to suggest a causal relationship, rather than a relationship cannot be ruled out.
- Alternative causes, such as underlying disease(s), concomitant therapy, and other risk factors, as well as the temporal relationship of the event to study intervention administration will be considered and investigated.
- The investigator will also consult the IB in his/her assessment.
- For each device deficiency, the investigator **must** document in the medical notes that he/she has reviewed the device deficiency and has provided an assessment of causality.
- There may be situations in which an SAE has occurred and the investigator has minimal information to include in the initial report to the sponsor. However, it is very important that the investigator always make an assessment of causality for every event before the initial transmission of the SAE data to the sponsor.
- The investigator may change his/her opinion of causality in light of follow-up information and send an SAE follow-up report with the updated causality assessment.
- The causality assessment is one of the criteria used when determining regulatory reporting requirements.

Follow-Up of Medical Device Deficiency
• The investigator is obligated to perform or arrange for the conduct of supplemental measurements and/or evaluations, as medically indicated or as requested by the sponsor to elucidate the nature and/or causality of the device deficiency as fully as possible. This may include additional laboratory tests or investigations, histopathological examinations, or consultation with other healthcare providers. • New or updated information regarding the nature of the device deficiency will be recorded in the originally completed Medical Device Complaint form. • New or updated information regarding any SAE that was potentially associated with the medical device deficiency will be submitted to Pfizer Safety on the Vaccine SAE Reporting Form within 24 hours of receipt of the information, according to the requirements provided in Appendix 3.

10.6.5. Reporting of SAEs

Reporting of an SAE to Pfizer Safety must be performed according to the processes described in Appendix 3 (Section 10.3.4).

10.6.6. Reporting of SADEs

SADE Reporting to Pfizer Safety
Note: There are additional reporting obligations for medical device deficiencies that are potentially related to SAEs (ie, a SADE) that must fulfill the legal responsibility to notify appropriate regulatory authorities and other entities about certain safety information relating to medical devices being used in clinical studies. • Any device deficiency that is associated with an SAE must be reported to the sponsor within 24 hours after the investigator determines that the event meets the definition of a device deficiency. • The sponsor shall review all device deficiencies and determine and document in writing whether they could have led to an SAE. These shall be reported to the regulatory authorities and IRBs/ECs as required by national regulations.

10.7. Appendix 7: Alternative Measures During Public Emergencies

The alternative study measures described in this section are to be followed during public emergencies, including the COVID-19 pandemic. This appendix applies for the duration of the COVID-19 pandemic in the US and will become effective for other public emergencies only upon written notification from Pfizer.

Use of these alternative study measures are expected to cease upon the return of business as usual (including the lifting of any quarantines and travel bans/advisories).

10.7.1. Telehealth Visits

In the event that in-clinic study visits cannot be conducted, every effort should be made to follow up on the safety of study participants at scheduled visits per the SoA or unscheduled visits. Telehealth visits may be used to continue to assess participant safety and collect data points. Telehealth includes the exchange of healthcare information and services via telecommunication technologies (eg, audio, video, video-conferencing software) remotely, allowing the participant and the investigator to communicate on aspects of clinical care, including medical advice, reminders, education, and safety monitoring. The following assessments must be performed during a telehealth visit:

- Review and record study intervention(s), including compliance and missed doses.
- Review and record any AEs and SAEs since the last contact. Refer to Section 8.3.
- Review and record any new concomitant medications or changes in concomitant medications since the last contact.
- Confirm that the participant is adhering to the contraception method(s) required in the protocol.

Study participants must be reminded to promptly notify site staff about any change in their health status.

10.7.2. Home Health Visits

A home health care service may be utilized to facilitate scheduled visits per the SoA. Home health visits include a healthcare provider conducting an in-person study visit at the participant's location, rather than an in-person study visit at the site. Conduct of home health visits is subject to approval of the sponsor. The following may be performed during a home health visit:

- Collection of a blood sample for immunogenicity assessments and to test for prior COVID-19. Please refer to the ISF for further instructions.

10.7.3. Adverse Events and Serious Adverse Events

If a participant has COVID-19 during the study, this should be reported as an AE or SAE and appropriate medical intervention provided. Study vaccination should continue unless the investigator/treating physician is concerned about the safety of the participant, in which case temporary or permanent discontinuation may be required.

It is recommended that the investigator discuss temporary or permanent discontinuation of study intervention with the study medical monitor.

10.8. Appendix 8: Abbreviations

The following is a list of abbreviations that may be used in the protocol.

Abbreviation	Term
13vPnC	13-valent pneumococcal conjugate vaccine
2019-nCoV	novel coronavirus 2019
20vPnC	20-valent pneumococcal conjugate vaccine
7vPnC	7-valent pneumococcal conjugate vaccine
ACIP	Advisory Committee on Immunization Practices
ADE	adverse device effect
AE	adverse event
AESI	adverse event of special interest
ALT	alanine aminotransferase
AOM	acute otitis media
AST	aspartate aminotransferase
CAP	community-acquired pneumonia
CBER	Center for Biologics Evaluation and Research
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
CI	confidence interval
CIOMS	Council for International Organizations of Medical Sciences
CK	creatine kinase
CONSORT	Consolidated Standards of Reporting Trials
COPD	chronic obstructive pulmonary disease
COVID-19	coronavirus disease 2019
CRF	case report form
CRM_{197}	cross-reactive material 197
CRO	contract research organization
CSR	clinical study report
DILI	drug-induced liver injury
CCI	[redacted]
DNA	deoxyribonucleic acid
DU	dispensable unit
EC	ethics committee
ECC	emergency contact card
ECG	electrocardiogram
eCRF	electronic case report form
EDB	exposure during breastfeeding
e-diary	electronic diary
EDP	exposure during pregnancy
EMA	European Medicines Agency
EU	European Union

Abbreviation	Term
EudraCT	European Clinical Trials Database
FDA	Food and Drug Administration
FSH	follicle-stimulating hormone
GCP	Good Clinical Practice
GGT	gamma-glutamyl transferase
GMC	geometric mean concentration
GMFR	geometric mean fold rise
GMT	geometric mean titer
HBe	hepatitis B e
HBeAg	hepatitis B e antigen
HBsAg	hepatitis B surface antigen
HBV	hepatitis B virus
HCV	hepatitis C virus
HIV	human immunodeficiency virus
HRT	hormone replacement therapy
IB	investigator's brochure
ICD	informed consent document
ICH	International Council for Harmonisation
ID	identification
IgG	immunoglobulin G
IND	investigational new drug
INR	international normalized ratio
IP manual	investigational product manual
IPAL	Investigational Product Accountability Log
IPD	invasive pneumococcal disease
IRB	institutional review board
IRT	interactive response technology
ISF	investigator site file
ISO	International Organization for Standardization
IWR	interactive Web-based response
LFT	liver function test
LLOQ	lower limit of quantitation
LNP	lipid nanoparticle
LRI	lower respiratory tract infection
MDR	medical device regulation
MERS	Middle East respiratory syndrome
modRNA	nucleoside-modified messenger ribonucleic acid
N/A	not applicable
NAAT	nucleic acid amplification test
N-binding	SARS-CoV-2 nucleoprotein–binding
NSAID	nonsteroidal anti-inflammatory drug

Abbreviation	Term
OPA	opsonophagocytic activity
P2 S	SARS-CoV-2 full-length, P2 mutant, prefusion spike glycoprotein
PFS	prefilled syringe
PI	principal investigator
PPE	personal protective equipment
PPSV23	23-valent pneumococcal polysaccharide vaccine
PT	prothrombin time
QTL	quality tolerance limit
CCI	[redacted]
RNA	ribonucleic acid
RSV	respiratory syncytial virus
S	spike protein
SADE	serious adverse device effect
SAE	serious adverse event
SAP	statistical analysis plan
SARS	severe acute respiratory syndrome
SARS-CoV-2	severe acute respiratory syndrome coronavirus 2
SoA	schedule of activities
SOP	standard operating procedure
SRSD	single reference safety document
SUSAR	suspected unexpected serious adverse reaction
TBili	total bilirubin
ULN	upper limit of normal
US	United States
USADE	unanticipated serious adverse device effect
VT	vaccine-type
WHO	World Health Organization
CCI	[redacted]

10.9. Appendix 9: Criteria for Allowing Inclusion of Participants With Chronic Stable HIV or HBV Infection or Cured HCV Infection

Potential participants with chronic stable HIV or HBV infection or cured HCV infection may be considered for inclusion if they fulfill the following respective criteria.

Known HIV infection

Confirmed stable HIV disease, defined as documented viral load 200 cells/mm3 within 6 months before enrollment, and on stable antiretroviral therapy for at least 6 months.

Known HBV infection

Confirmed inactive chronic HBV infection, defined as HBsAg present for ≥6 months and the following:

- HBeAg negative, anti-HBe positive
- Serum HBV DNA <2000 IU/mL
- Persistently normal ALT and/or AST levels

In those who have had a liver biopsy performed, findings that confirm the absence of significant necroinflammation.

Known cured HCV infection

- History of chronic HCV with evidence of sustained virological response (defined as undetectable HCV RNA) for ≥12 weeks following HCV treatment or without evidence of HCV RNA viremia (undetectable HCV viral load).

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