5a COVID-19

NOTIFIABLE

In some circumstances, advice in these guidelines may differ from that in the Summary of Product Characteristics (SmPC) of the vaccines. When this occurs, the recommendations in these guidelines, which are based on current expert advice from NIAC, should be followed.

NOTE:
This chapter will be updated as new evidence becomes available.

Acronyms used in this chapter

AEFI	Adverse event following immunisation
BMI	Body mass index
BTS/SIGN	British Thoracic Society/Scottish Intercollegiate Guidelines Network
COPD	Chronic Obstructive Pulmonary Disease
COVID-19	Coronavirus disease 2019
EC	European Commission
EMA	European Medicines Agency
HCW	Healthcare worker
HPRA	Health Products Regulatory Authority
HPV	Human Papillomavirus
IM	Intramuscular
MERS	Middle East Respiratory Syndrome
mRNA	Messenger RNA
NIAC	National Immunisation Advisory Committee
NIO	National Immunisation Office
NA	Neutralising antibody
PCR	Polymerase Chain Reaction
PEG	Polyethylene glycol
S antigen	Spike glycoprotein
SARS	Severe Acute Respiratory Syndrome
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SmPC	Summary of Product Characteristics
TTS	Thrombosis thrombocytopenia Syndrome
VOC	Variants of concern
WHO	World Health Organization

Key changes (9 July 2021)

Spikevax®

Storage conditions

Key changes (5 July 2021)

COVID-19 Vaccine safety

- TTS following COVID-19 vaccination

Table 5a.3

Table 5a.4

Precautions for all COVID-19 vaccines

5a.1 Introduction

Seven coronaviruses are known to be capable of causing disease in humans. Four of these (229E, NL63, OC43, HKU1) generally cause minor respiratory illnesses. Rarely they cause more serious lower respiratory tract disease in those with an underlying pulmonary disorder or immunocompromise. Three coronaviruses – Middle East Respiratory Syndrome coronavirus, Severe Acute Respiratory Syndrome coronavirus (SARS-CoV), and Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2) cause more severe disease. The disease caused by SARS-CoV-2 is termed COVID-19.

5a.2 Epidemiology

Note: Refer to www.hpsc.ie for the most up-to-date information on COVID-19 epidemiology.

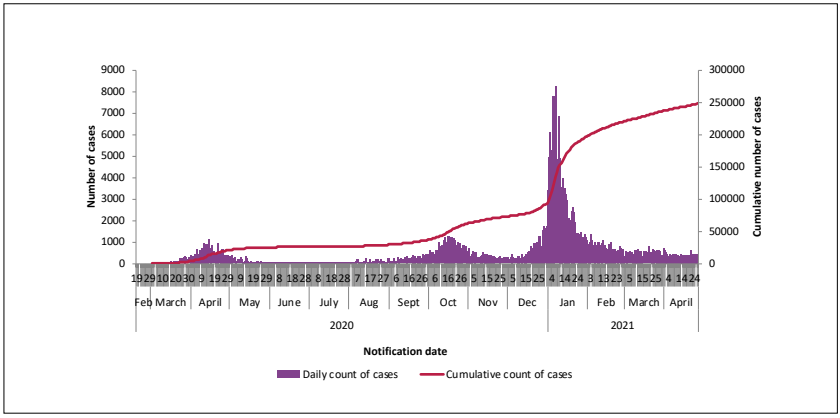
In December 2019, an outbreak of severe pneumonia was reported in Wuhan, China. The causative organism was a coronavirus, since named **S**evere **A**cute **R**espiratory **S**yndrome **Co**rona**V**irus type 2 (SARS-CoV-2). The disease it causes is called **Co**rona**vi**rus **d**isease 20**19** (COVID-19). On March 11th, 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic.

As of 25 June, 2021, 180 million cases and over 3.9 million deaths from COVID-19 have been reported.

On 31 May 2021, the WHO renamed the four variants of concern (VOC): Alpha (B.1.1.7), Beta (B.1.353), Gamma (P.1) and Delta (B.1.617.2). Ongoing surveillance shows that Alpha (B.1.1.7), continues to be the predominant strain in Ireland (89%).

In Ireland, the first laboratory confirmed case of COVID-19 in Ireland was on 29 February 2020. Since then there have been three waves, peaking in April and October, 2020, and January, 2021.

Figure 5a.1 Number and cumulative number of confirmed COVID-19 cases notified in Ireland by notification date to midnight 26/04/21
Source: HPSC



The highest proportion of hospitalisations and deaths have been in those aged 65 and older. Of those hospitalised with COVID-19, 63% had an underlying medical condition. Of those admitted to an intensive care unit, 89% had an underlying medical condition.

The main underlying medical conditions associated with increased risk of hospitalisation are chronic respiratory disease, chronic heart disease, hypertension, Type I and Type II diabetes mellitus, chronic neurological disease, cancer, obesity (Body mass index (BMI) ≥40), and chronic kidney disease. Other conditions that have been associated with an increased risk of having a complicated course include immunocompromise due to disease or treatment, inherited metabolic disorders, intellectual disability (including Down syndrome), severe mental illness and sickle cell disease.

In the first wave in Ireland, 56% of deaths occurred among residents of nursing homes and long-term care facilities. Healthcare workers (HCW) accounted for 30% cases and one third of these occurred in those working in long-stay care facilities (nursing homes,residential institutions, community hospitals). Since the start of the pandemic, HCW have accounted for 10% of cases. This figure continues to decline with increasing HCW vaccine uptake.

Outbreaks have occurred among patients and staff in hospitals, and among people living or working in crowded situations where self-isolation and physical distancing may be difficult to maintain (e.g. meat processing plants, the Irish Traveller community and direct provision centres).

The lowest proportion of hospitalisations and deaths is in those under 15 years of age.

Transmission
Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4. The R_0 in confined settings may be at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} depends on a range of factors, including isolation, quarantine, physical distancing, and mask wearing. Some strains (e.g. Delta and Kappa) are more transmissible.

Transmission occurs mainly indoors through contact within 2 metres for more than 15 minutes cumulative exposure via respiratory droplets or aerosol. Factors that increase the risk of infection include presence in an enclosed space with inadequate ventilation, increased exhalation of respiratory fluids if an infectious person is e.g. shouting, singing exercising), and exposure for more than 15 minutes.

Young children are less likely to transmit infection than adolescents or adults.

SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions.

The **incubation period** is 5 to 6 days (range 1-14 or longer). Around 1% of COVID-19 cases develop symptoms more than 14 days after exposure.

Infectious period Transmission can occur 1-3 days before symptom onset. Peak viral load declines after the first week of symptoms. Those with mild to moderate COVID-19 may shed the virus for up to 10 days following onset of symptoms. Some of those with severe COVID-19 may shed virus for up to 20 days. Asymptomatic persons can transmit the virus, but for shorter periods.

5a.3 Effects of COVID-19

5a.3.1. Symptoms

Overall, 80% of infections are asymptomatic or mild, 15% moderate and 5% severe. Estimates of the proportion of cases which remain asymptomatic range from 15 to 48%. These figures are estimates and vary across different countries, age cohorts and ethnic groups.

The most common symptoms are fever, dry cough, dyspnoea, fatigue and anorexia. Loss of smell and/or taste are seen in approximately 50% and 40% of cases, respectively. Less common symptoms include myalgia, sore throat, diarrhoea, conjunctivitis, headache, rash, and chest pain or pressure. Other symptoms include headache, sore throat, myalgia, rhinorrhoea, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis.

Symptoms among those aged 65 years and older and those with underlying medical conditions may be atypical, and fever or respiratory symptoms may be absent. While severe illness and death have been reported at all ages, severe illness and death are higher in those:

- Age 65 and older
- Age 18-64 years with medical conditions outlined in Table 5.2 below.
- From Black, Asian and minority ethnic backgrounds

The majority of cases recover from infection without clinical intervention. However, approximately 20% of identified cases globally have resulted in hospitalisation. In up to 80% of patients symptoms last more than two weeks. Long-term symptoms ("Long COVID") include fatigue, headache, mood changes, chest pain, palpitations, hair loss, and dyspnoea. Long-term symptoms following COVID-19 are more likely with increasing age, BMI and female sex.

5a.3.2 Pregnancy

Pregnant women are at similar risk of COVID-19 infection to non-pregnant women of the same age. The overall risk of severe illness in pregnancy is low. However, pregnant women with COVID-19 infection are more likely to be admitted to ICU or to die than either pregnant women without COVID-19 or similar aged non-pregnant women with COVID-19. Pregnant women from Black, Asian and minority ethnic backgrounds may be more likely to be admitted to hospital with COVID-19 disease than other pregnant women.

COVID-19 in pregnancy may increase the risk of adverse pregnancy outcomes, such as late miscarriage, stillbirth and preterm birth.

The following factors may increase the risks of severe illness in pregnant women:

- Those listed in Table 5.2
- Age >35 years
- Infection in the third trimester (28 weeks or more)
- BMI ≥30

5a.3.3 Children: In addition to the risk factors listed in Table 5.2, the risks of severe disease and death may be increased in children and adolescents with medical complexity and some severe genetic disorders.Consideration may be given to offering vaccination to those aged >12 years of age.

5a.4. Vaccines

5a.4.1 Types of vaccines

mRNA vaccines

Messenger RNA vaccines include genetic material (mRNA) that instructs the recipient's antigen-presenting cells to make a spike protein antigen, thus stimulating an immune response. Rapid degradation of mRNA within cells contributes to the safety profile of these vaccines.

CVnCoV vaccine (Curevac) is undergoing an EMA rolling review.

Viral vector vaccines

A non-pathogenic virus is genetically modified to encode an antigen which, when expressed by the host cell, provokes an immune response.

Sputnik V (Gam-COVID-Vac) is undergoing an EMA rolling review.

Protein subunit vaccines

These vaccines are based on injection of key viral antigens stimulating the immune response.

NVX-CoV2373 vaccine (Novavax) is undergoing an EMA rolling review.

Virus Like Particle vaccines

Virus like particles mimic a virus structure, stimulating an immune response. They are not infectious as they contain no genetic material.

Whole virus vaccines

These consist of attenuated or inactivated virus.

5a.4.2 COVID-19 vaccine safety

While vaccine development has been rapid, the very high standards for safety monitoring have not been compromised. To date over one billion individuals have received a COVID-19 vaccine. Following close post-marketing monitoring, the benefit/risk of all authorised vaccines remains positive.

Thrombosis with Thrombocytopenia Syndrome (TTS) following COVID-19 vaccination

In March, 2021, a number of reports of blood clots associated with thrombocytopenia within weeks of Vaxzevria® vaccination were received by the EMA. The thrombi occurred in unusual locations including cerebral venous sinus thrombosis (CVST), the splanchnic vein and in arteries. Subsequently, similar reports were received in the US following COVID-19 Vaccine Janssen®. The association is now termed Thrombosis with Thrombocytopenia Syndrome (TTS).

It is estimated that 1 in 100,000 people aged 50 and older and 1 in 50,000 people aged 18-49 vaccinated with Vaxzevria® may develop TTS*. One in 5 of these may die. Preliminary UK evidence suggests that the risk of TTS is possibly substantially lower (1.6/million) after a second dose of Vaxzevria®.

Based on data* from the United States it is estimated that 1/300,000 people who are vaccinated with COVID-19 Vaccine Janssen® may develop TTS. One in 10 of these may die.

The risk of TTS is higher in younger people. It is not yet known if there is a sex difference.

A similar condition can occur very rarely in recipients of heparin. CVST and thrombosis without thrombocytopenia can occur in the general population, however the biological mechanism in these thromboses differs from that in TTS.

The risks of CVST from COVID-19 are much greater than the risk of TTS associated with the vaccine and increase with age. In the US, the incidence of CVST in those admitted to hospital within two weeks following COVID-19 infection is about 4/ 100,000. Approximately one in five COVID-19 patients admitted to ICU has thrombosis as a complication.

No specific risk factors for TTS have been confirmed. There is no evidence of an increased risk for those with clotting or platelet disorders e.g. idiopathic or heparin induced thrombocytopenia, autoimmune conditions, history of cerebral venous sinus thrombosis, acquired or hereditary thrombophilia, antiphospholipid syndrome, or pregnancy.

Early recognition and prompt treatment are important in the management of TTS. Treatment guidelines have been developed, and appropriate management has improved the outcome. However, TTS remains a condition of serious consequences that is potentially fatal.

Healthcare professionals should be alert to the signs and symptoms of thromboembolism and/or thrombocytopenia. Vaccine recipients should be advised to promptly seek medical attention if they develop symptoms such as shortness of breath, chest pain, leg swelling, persistent abdominal pain within weeks of vaccination, or neurological symptoms including severe or persistent headaches (particularly 3 or more days after vaccination), blurred vision, confusion or seizures, or petechiae/ecchymoses beyond the site of vaccination.

* based on currently available data

Healthcare professionals should seek early expert advice from the National Coagulation Centre about specialised testing and treatment options for patients presenting with thromboembolic events associated with thrombocytopenia (including DIC or CVST) occurring within weeks following viral vector vaccination.

Vaccine availability and storage

An up-to-date list of licensed vaccines is available on the Health Products Regulatory Authority (HPRA) website www.hpra.ie

A list of the vaccines currently available from the National Cold Chain Service can be found at https://www.hse.ie/eng/health/immunisation/

Vaccines should be stored at the temperature specified in the Summary of Product Characteristics (SmPC). Those that require reconstitution must be used within a defined number of hours.

All vaccines are provided in multi-dose vials. Appropriate infection control precautions should always be taken. Specific guidelines are available on the National Immunisation Office (NIO) website at www.immunisation.ie

5a.5 Recommendations

The objective of the COVID-19 vaccination programme is to ensure equitable access to a safe and effective vaccine with the goals of limiting mortality and morbidity from COVID-19, protecting healthcare capacity and enabling social and economic activity.

While vaccine supplies are limited it is recommended vaccination is carried out in the following order (although they may be overlap for operational reasons):

Table 5.1 Priority groups for COVID-19 vaccination

Group	Rationale
Adults aged ≥65 years who are residents of long-term care facilities. Consider offering vaccination to all residents and staff on site	At greatest risk of severe illness and death In Ireland, in the first wave of COVID-19, 56% of deaths occurred in this setting
Frontline HCW* in direct patient contact roles or who risk exposure to bodily fluids or aerosols	At very high or high risk of exposure and/or transmission. In the first wave over 30% of cases were in healthcare workers
Aged 70 and older in the following order: 85 and older 80-84 75-79 70-74	At higher risk of hospitalisation and death
Aged 16-69 with medical conditions that put them at very high risk** of disease	At similar very high risk of hospitalisation and death as those aged 70-74

Aged 65-69. Prioritise those with medical conditions** which put them at high risk of severe disease Other HCWs not in direct patient contact Key workers	At higher risk of hospitalisation and death Provide essential health services, protect patients Providing services essential to the vaccination programme
Aged 18-64 years with medical conditions** which put them at high risk of severe disease	At higher risk of hospitalisation
Aged 16 - 64 years Residents of long-term care facilities Traveller and Roma communities People who are homeless Aged 16 - 64 years in descending order e.g. 10-year cohorts 55-64 45-54 35-44 25-34 16-24	Based on risk of ICU admission and death

* HCW who work in and out of all healthcare settings including vaccinators
**See Table 5.2

Pregnant women should be offered COVID-19 vaccination between 14-36 completed weeks gestation following an individual benefit/risk discussion with their obstetric caregiver.

Table 5.2 Medical conditions and medication associated with very high risk or high risk of severe COVID-19 disease.

May also include others, based on clinical judgement and a needs assessment.

Conditions in the shaded areas may be associated with a suboptimal response to vaccines and patients with these conditions should be given a mRNA vaccine if practicable and timely. However, if preferential selection of a mRNA vaccine will result in delayed vaccination for more than 3 weeks, any benefit of using a higher efficacy vaccine may be lost.

Medical condition	Very high risk	High risk
Cancer	All cancer patients actively receiving (and/or within 6 weeks of receiving) systemic therapy with cytotoxic chemotherapy, targeted therapy, monoclonal antibodies or immunotherapies and surgery or radical radiotherapy for lung or head and neck cancer All patients with advanced/ metastatic cancers	Haematological - within 1 year Haematological - within 1 - 5 years Non-haematological - within 1 year All other cancers on non-hormonal treatment

Chronic heart and vascular disease		e.g. heart failure, hypertensive cardiac disease
Chronic kidney disease	On dialysis, or eGFR <15 ml/min	eGFR <30ml/min
Chronic liver disease		e.g. cirrhosis or fibrosis
Chronic neurological disease or condition	With evolving respiratory failure requiring non-invasive ventilation e.g. motor neurone disease, spinal muscular atrophy	Significantly compromising respiratory function and/or the ability to clear secretions e.g. Parkinson's disease, cerebral palsy
Chronic respiratory disease	Severe e.g. severe cystic fibrosis, severe COPD, severe pulmonary fibrosis	Other e.g. stable cystic fibrosis, severe asthma (continuous or repeated use of systemic corticosteroids), moderate COPD
Diabetes	HbA1c ≥58mmol/mol	All other diabetes (Type 1 and 2)
Immunocompromise due to disease or treatment	Severe e.g. **Transplantation:** - Listed for solid organ or haematopoietic stem cell transplant (HSCT) - Post solid organ transplant at any time - Post HSCT within 12 months **Genetic diseases:** - APECED[1] - Inborn errors in the interferon pathway **Treatment:** - including but not limited to Cyclophosphamide, Rituximab, Alemtuzumab, Cladribine or Ocrelizumab in the last 6 months	Other e.g. High dose systemic steroids[2] Persons living with HIV
Inherited metabolic diseases	Disorders of intermediary metabolism/at risk of acute decompensation e.g. Maple Syrup Urine Disease	Disorders of intermediary metabolism not fulfilling criteria for very high risk
Intellectual disability	Down Syndrome	Intellectual disability excluding Down Syndrome
Obesity	BMI >40 Kg/m^2	BMI >35 Kg/m^2

Severe mental illness		e.g. Schizophrenia, bipolar disorder, severe depression
Sickle cell disease	Sickle cell disease	

[1] APECED - autoimmune polyendocrinopathy candidiasis ectodermal dystrophy
[2] The following doses of prednisolone (or equivalent dose of other glucocorticoid) may increase the risk of severe COVID-19 disease:

- ≥10mg per day for more than 4 weeks with one other immunosuppressant
- ≥20mg per day for more than 4 weeks

Pregnant women should be offered mRNA COVID-19 vaccination between 14-36 completed weeks gestation following an individual benefit/risk discussion with their obstetric caregiver.

Conditionally authorised COVID-19 vaccines

- **Comirnaty® (Pfizer/BioNTech)**
- **Spikevax®** (formerly COVID-19 Vaccine Moderna®)
- **Vaxzevria®** (formerly COVID-19 Vaccine AstraZeneca®)
- **COVID-19 Vaccine Janssen®**

Any currently authorised COVID-19 vaccine can be given to adults of all ages, unless contraindicated.

Comirnaty®(Pfizer/BioNTech) is the only authorised COVID-19 vaccine for those aged 12-17 years.

mRNA vaccines

Table 5a.3: Vaccination of those due an mRNA COVID-19 vaccine

	History	Action
Contraindication	• Anaphylaxis after a previous dose of Comirnaty® or Spikevax® (formerly COVID-19 vaccine Moderna®) • Anaphylaxis after polyethylene glycol (PEG, e.g., some bowel preparations for endoscopy, certain laxatives such as Movicol®)	Consider vaccination with Vaxzevria® or COVID-19 vaccine Janssen® in a suitable facility Observe for 30 minutes or Discuss with allergist/ immunologist
	• Anaphylaxis after Trometamol®; Spikevax® (formerly COVID-19 vaccine Moderna®) is contraindicated	Vaccinate with alternate vaccine
Special precautions	• Anaphylaxis after multiple, different drug classes, with no identified allergen (may indicate PEG allergy) • Anaphylaxis after a vaccine, or a medicine known to contain PEG • Unexplained anaphylaxis (may indicate PEG allergy)	Clarify if PEG is tolerated (see FAQs) Discuss with allergist/ immunologist Consider vaccination with Vaxzevria® or COVID-19 vaccine Janssen® Observe for 30 minutes
	• Mastocytosis • Idiopathic anaphylaxis • Anaphylaxis after food, venom or medication	Vaccinate as scheduled Observe for 30 minutes
Not a contraindication or a precaution	• Non-anaphylactic food allergy • Family history of allergy, including anaphylaxis • Previous local reaction to any vaccine • Hereditary angioedema • Contact dermatitis to PEG containing cosmetic product • Underlying asthma • Hay fever • NSAID allergy • Chronic spontaneous urticaria	Vaccinate as scheduled Observe for 15 minutes

Comirnaty® (Pfizer/BioNTech)

This medicinal product is subject to additional monitoring. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse reactions to the HPRA.

The vaccine should be stored in a freezer at -80°C to -60°C. Each pack contains 195 vials. Vials should be transferred to +2°C to +8°C to thaw which may take 3 hours. Alternatively, frozen vials may be thawed for 30 minutes at temperatures up to +30°C for immediate use.

After thawing, undiluted vaccine can be stored for up to one month (31 days) at +2°C to +8°C and up to 2 hours at up to +30°C. Once thawed, the vaccine cannot be re-frozen.

The vaccine requires dilution with 1.8ml of 0.9% sodium chloride. After dilution, the vaccine should be kept at +2°C to +30°C and used within 6 hours.

Licensed indications
Active immunisation to prevent COVID-19 caused by SARS-CoV-2 virus, in individuals 12 years of age and older.

Vaccine efficacy
Efficacy is 95-100% after two doses in those aged 12 and older.

Vaccine effectiveness
A large trial in Israel showed two dose effectiveness of 87% (95% CI, 55 to 100) against hospitalisation and 92% against severe disease from 7 days after the second dose. This effectiveness may not apply to all variants.

Dose, route and schedule
The dose of vaccine is 0.3 ml intramuscularly (IM) into the deltoid muscle. The course consists of 2 doses 21-28 days apart.

If more than six 0.3ml doses can be safely and accurately withdrawn from a diluted vial, they can be used as valid doses. There should be no pooling of the contents of different vials.

If the interval between doses is longer than 28 days, the second dose should be given as soon as possible. The course does not need to be restarted.

If the second dose is given between 17 and 20 days after the first dose, it is a valid dose. If the second dose is given before 17 days, this is not considered a valid vaccine. A third dose should be given 28 days after the second (invalid) vaccine.

Interchangeability
There is insufficient data on the interchangeability of Comirnaty® and other COVID-19 vaccines. The same vaccine should be used for both doses.

Consideration may be given to viral vector vaccination after anaphylaxis to a dose of this vaccine. The viral vector vaccine should be given after an interval of at least 28 days.

Contraindications (see Table 5a.3)
Anaphylaxis (serious systemic allergic reaction requiring medical intervention) following a previous dose of the vaccine or any of its constituents (including polyethylene glycol (PEG)).

Anaphylaxis following another mRNA vaccine.

Those with a contraindication to one mRNA COVID-19 vaccine should not receive another authorised mRNA vaccine. Consideration may be given to viral vector vaccination which should be given after an interval of at least 28 days.

Appropriate support should be available in case of anaphylaxis or fainting after vaccine administration.

Precautions should be in place to minimise injury from fainting.

Precautions (see Table 5a.3)
Acute severe febrile illness; defer until recovery.

Consider viral vector vaccination for those with:

- Anaphylaxis after multiple, different drug classes, with no identified allergen (may indicate PEG allergy)
- Anaphylaxis after a vaccine, or a medicine which contained PEG
- Unexplained anaphylaxis (may indicate PEG allergy)

If vaccination is advised for a person with prior anaphylaxis to an unrelated allergen observe for 30 minutes after vaccination.

For more information see Frequently Asked Questions about COVID-19 vaccines for people with pre-existing allergic conditions.

Patients with planned immunosuppressive therapy should ideally complete vaccination two weeks before treatment. The recommended minimum interval may be used. Specialists should consider the individual's risk and likelihood of disease exposure, and provide advice based on knowledge and understanding of the patient's immune status and likely immune response to vaccination.

Vaccination after COVID-19
Those with persisting symptoms post COVID-19 may be vaccinated, unless there is evidence of recent clinical deterioration.

Vaccination should be deferred until clinical recovery from COVID-19 infection and for at least four weeks after diagnosis or onset of symptoms, or four weeks from the first PCR positive specimen in those who are asymptomatic.

Those aged under 65 years who are not immunocompromised
Vaccination may be deferred for up to nine months after diagnosis, symptom onset, or from the first PCR or antigen positive specimen.

Those who have had previous laboratory confirmed COVID-19 infection within 9 months:
- aged *50 years and older* should receive a full COVID-19 vaccine schedule
- aged *under 50 years and immunocompromised* should receive a full COVID-19 vaccine schedule
- aged *under 50 years and immunocompetent*: a single dose of COVID-19 vaccine is sufficient and they should then be considered fully vaccinated.

Those who have had laboratory confirmed COVID-19 infection within 9 months after a first dose of COVID-19 vaccine should complete the vaccine course.

Post vaccination observation period
- Those with no history of anaphylaxis: 15 minutes
- Those with a history of anaphylaxis from any cause: 30 minutes
- Those with immediate itching, swelling or urticarial reaction at the vaccination site: 30 minutes or longer as clinically indicated

Immunocompromised *(see Chapter 3)*
Data are not currently available to establish vaccine safety or efficacy in these groups. Individuals with immunosuppression due to disease or treatment may be vaccinated if they have no contraindications.

See Table 5.2 for conditions that may be associated with a suboptimal response to vaccines and should be given a mRNA vaccine if practicable and timely. However, if preferential selection of a mRNA vaccine will result in delayed vaccination for more than 3 weeks, any benefit of using a higher efficacy vaccine may be lost.

Pregnancy
Animal reproductive toxicology studies of the mRNA vaccines did not identify any safety concerns.

There is no evidence that any COVID-19 vaccine affects fertility or the fetus. No unexpected pregnancy or infant outcomes have been observed related to COVID-19 vaccination during pregnancy. Long term follow up of vaccine recipients and their child is ongoing.

Pregnant women and their obstetric caregivers should engage in shared decision-making in advance of vaccination. Counselling should balance available data on vaccine safety, risks to pregnant women from COVID-19 infection, and a woman's individual risk for infection and severe disease.

The two doses should be given 28 days apart, between 14 and 36 completed weeks of gestation.

Breastfeeding
There is no known reason for vaccinees to avoid breastfeeding.

Vaccination of those with bleeding disorders or on anticoagulants
Individuals with a bleeding disorder or receiving anticoagulant therapy may develop haematomas in IM injection sites. Prior to vaccination, inform the recipient about this risk. For those with thrombocytopenia (platelet count<$50x10^9$/L), consult the supervising consultant. People with mild bleeding disorders or on maintenance dose Emicizumab (Hemlibra®) do not require haemostatic cover for vaccination. Details of haemostatic cover for all others can be found in the Patient Information tab at http://www.stjames.ie/services/hope/nationalcoagulationcentre

Those with inherited coagulopathies who require factor replacement therapy should receive it on the day of vaccination, prior to the IM vaccination.

If there is uncertainty about the need for cover, contact the patient's Comprehensive Care Centre.

Those receiving long-term anticoagulation with either Warfarin® or heparin are not considered to be at higher risk of bleeding complications following vaccination. There is no reason to expect that there is a greater risk of bleeding complications with the oral anticoagulants or antiplatelet agents, than with other anticoagulants.

People on Warfarin® should follow their usual schedule for international normalised ratio (INR) testing and can be vaccinated if it is less than 4.0. If the INR is 4.0 or more, follow the advice of the clinic/practice managing Warfarin® and wait until the INR is less than 4.0 to be vaccinated.

See Chapter 2, sections 2.4.6 and 2.4.7 for further information, including technique for IM injection, in this patient group.

Adverse reactions

A full list of adverse reactions may be found in the Summary of Product Characteristics (SmPC).

Terms used for frequency of adverse events

Very common:	>1/10
Common:	>1/100 and <1/10
Uncommon:	>1/1,000 and <1/100
Rare:	>1/10,000 and <1/1,000
Very rare:	<1/10,000
Local:	Very common: injection site pain and swelling
	Common: injection site erythema
	Uncommon: injection site pruritus
General:	Very common: arthralgia, diarrhoea, fatigue, fever, headache, myalgia
	Common: nausea, vomiting
	Uncommon: insomnia, hypersensitivity reactions (e.g. rash, pruritus, angioedema), lymphadenopathy in the same arm as vaccination, malaise, extremity pain
	Rare: acute peripheral facial paralysis, facial swelling (in those with a history of dermatological fillers)

The most frequent adverse reactions during clinical trials in those aged ≥16 years were injection site pain (> 80%), fatigue (> 60%), headache (> 50%), myalgia and chills (> 30%), arthralgia (> 20%), pyrexia and injection site swelling (> 10%), which were usually mild or moderate in intensity, and resolved within a few days after vaccination. A lower frequency of adverse events is associated with greater age. A higher rate of pyrexia is seen after the second dose.

Post marketing surveillance has reported an anaphylaxis rate of 2-5/ million in the US and 14/million in the UK (the latter figure includes anaphylactoid reactions). These rates are higher than after non COVID-19 vaccines.

Co-administration
COVID-19 vaccines and other vaccines may be administered at the same time or at any interval.

As it is not known if COVID-19 vaccine reactogenicity is increased with co-administration, vaccines should preferably be given in different limbs.

Duration of immunity
There is insufficient information to determine the duration of protection from the vaccine.

Vaccine recipients may not have optimal protection until 7 days after the second dose, and the vaccine may not protect all vaccinees.

Vaccinated persons should continue to follow current public health guidance to protect themselves and others.

Booster doses
The need for and timing of booster doses has not been established.

Spikevax® (formerly COVID-19 Vaccine Moderna®)

This medicinal product is subject to additional monitoring. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse reactions to the HPRA.

The vaccine should be stored in a freezer at -25°C to -15°C. Each pack contains 10 vials. Vials should be transferred to +2°C to +8°C to thaw which may take 2 and a half hours, and must sit at room temperature for 15 minutes before administering. Alternatively, frozen vials may be thawed for 1 hour at room temperature between +15°C to +25°C for immediate use.

After thawing, the vaccine can be stored for up to 30 days at +2°C to +8°C and up to 24 hours at +8°C up to +25°C. Once thawed, the vaccine cannot be re-frozen.

The vaccine does not require dilution. Once the multidose vial is punctured the vaccine should be kept at +2°C to +25°C and used as soon as possible and within 19 hours.

Licensed indications
Active immunisation to prevent COVID-19 caused by SARS-CoV-2 virus, in individuals 18 years of age and older.

Vaccine efficacy
Clinical trial data demonstrated a two-dose vaccine efficacy of 94.1% (95% confidence interval of 89.3% to 96.8%) in those aged 18 and above. This efficacy may not apply to all variants.

Dose, route and schedule
The dose of vaccine is 0.5 ml IM, preferably into the deltoid muscle. The course consists of two doses, 28 days apart.

If more than ten 0.5ml doses can be safely and accurately withdrawn from a vial, they can be used as valid vaccines doses. There should be no pooling of the contents of different vaccine vials.

If the interval between doses is longer than 28 days, the second dose should be given as soon as possible. The course does not need to be restarted.

If the second dose was given between 24 and 27 days after the first dose, it is a valid dose. If the second dose is given before 24 days, this is not considered a valid vaccine. A third dose should be given 28 days after the second (invalid) vaccine.

Interchangeability
There are no data on the interchangeability of COVID-19 vaccines. The same vaccine should be used for both doses.

Consideration may be given to viral vector vaccination after anaphylaxis to a dose of this vaccine. The viral vector vaccine should be given after an interval of at least 28 days.

Contraindications (see Table 5a.3)
Anaphylaxis (serious systemic allergic reaction requiring medical intervention) following a previous dose of the vaccine or any of its constituents (including polyethylene glycol (PEG)).

Anaphylaxis following another mRNA vaccine.

Those with a contraindication to one mRNA COVID-19 vaccine should not receive another authorised mRNA vaccine. Consideration may be given to viral vector vaccination which should be given after an interval of at least 28 days.

Appropriate support should be available in case of anaphylaxis or fainting after vaccine administration.

Precautions should be in place to minimise injury from fainting.

Precautions (see Table 5a.3)
Acute severe febrile illness; defer until recovery.

Consider viral vector vaccination for those with:

- Anaphylaxis after multiple, different drug classes, with no identified allergen (may indicate PEG allergy)
- Anaphylaxis after a vaccine, or a medicine which contained PEG
- Unexplained anaphylaxis (may indicate PEG allergy)

If vaccination is advised for a person with prior anaphylaxis to an unrelated allergen observe for 30 minutes after vaccination.

For more information see Frequently Asked Questions about COVID-19 vaccines for people with pre-existing allergic conditions

Patients with planned immunosuppressive therapy should ideally complete vaccination two weeks before treatment. The recommended minimum interval may be used. Specialists should consider the individual's risk and likelihood of disease exposure, and provide advice based on knowledge and understanding of the patient's immune status and likely immune response to vaccination.

Vaccination after COVID-19
Those with persisting symptoms post COVID-19 may be vaccinated, unless there is evidence of recent clinical deterioration.

Vaccination should be deferred until clinical recovery from COVID-19 and for at least four weeks after diagnosis or onset of symptoms, or four weeks from the first PCR positive specimen in those who are asymptomatic.

Those aged under 65 years who are not immunocompromised:
Vaccination may be deferred for up to nine months after diagnosis, symptom onset, or from the first PCR or antigen positive specimen.

Those who have had previous laboratory confirmed COVID-19 infection within 9 months:

- aged *50 years and older* should receive a full COVID-19 vaccine schedule
- aged *under 50 years and immunocompromised* should receive a full COVID-19 vaccine schedule
- aged *under 50 years and immunocompetent*: a single dose of COVID-19 vaccine is sufficient and they should then be considered fully vaccinated.

Those who have had laboratory confirmed COVID-19 infection within 9 months after a first dose of COVID-19 vaccine should complete the vaccine course.

Post vaccination observation period

- Those with no history of anaphylaxis: 15 minutes
- Those with a history of anaphylaxis from any cause: 30 minutes
- Those with immediate itching, swelling or urticarial reaction at the vaccination site: 30 minutes or longer as clinically indicated

Immunocompromised *(see Chapter 3)*
Data are not currently available to establish vaccine safety or efficacy in these groups. Individuals with immunosuppression due to disease or treatment may be vaccinated if they have no contraindications.

See Table 5.2 for conditions that may be associated with a suboptimal response to vaccines and should be given a mRNA vaccine if practicable and timely However, if preferential selection of a mRNA vaccine will result in delayed vaccination for more than 3 weeks, any benefit of using a higher efficacy vaccine may be lost.

Pregnancy
Animal reproductive toxicology studies of the mRNA vaccines did not identify any safety concerns.

There is no evidence that any COVID-19 vaccine affects fertility or the fetus. No unexpected pregnancy or infant outcomes have been observed related to COVID-19 vaccination during pregnancy. Long term follow up of vaccine recipients and their child is ongoing.

Pregnant women and their obstetric caregivers should engage in shared decision-making in advance of vaccination. Counselling should balance available data on vaccine safety, risks to pregnant women from COVID-19 infection, and a woman's individual risk for infection and severe disease.

The two doses should be given 28 days apart, between 14 and 36 completed weeks of gestation.

Breastfeeding
There is no known reason for vaccinees to avoid breastfeeding.

Children and adolescents under 18 years of age
There are no data available on vaccine safety and efficacy in children.

Vaccination of those with bleeding disorders or on anticoagulants
Individuals with a bleeding disorder or receiving anticoagulant therapy may develop haematomas in IM injection sites. Prior to vaccination, inform the recipient about this risk. For those with thrombocytopenia (platelet count<$50x10^9$/L), consult the supervising consultant. People with mild bleeding

disorders or on maintenance dose Emicizumab (Hemlibra®) do not require haemostatic cover for vaccination. Details of haemostatic cover for all others can be found in the Patient Information tab at http://www.stjames.ie/services/hope/nationalcoagulationcentre

Those with inherited coagulopathies who require factor replacement therapy should receive it on the day of vaccination, prior to the IM vaccination.

If there is uncertainty about the need for cover, contact the patient's Comprehensive Care Centre.

Those receiving long-term anticoagulation with either Warfarin® or heparin are not considered to be at higher risk of bleeding complications following vaccination. There is no reason to expect that there is a greater risk of bleeding complications with the newer oral anticoagulants or antiplatelet agents, than with other anticoagulants.

People on Warfarin® should follow their usual schedule for international normalised ratio (INR) testing and can be vaccinated if it is less than 4.0. If the INR is 4.0 or more, follow the advice of the clinic/practice managing Warfarin® and wait until the INR is less than 4.0 to be vaccinated.

See Chapter 2, sections 2.4.6 and 2.4.7 for further information, including technique for IM injection, in this patient group.

Adverse reactions
A full list of adverse reactions may be found in the Summary of Product characteristics (SmPC).

Terms used for frequency of adverse events

Very common:	>1/10
Common:	>1/100 and <1/10
Uncommon:	>1/1,000 and <1/100
Rare:	>1/10,000 and <1/1,000
Very rare:	<1/10,000

Local:	Very common: injection site pain and swelling Common: injection site erythema, rash and urticaria Uncommon: injection site pruritis
General:	Very common: arthralgia, axillary lymphadenopathy on the side of injection, chills, fatigue, fever, headache, myalgia, nausea, vomiting Rare: acute peripheral facial paralysis, facial swelling (in those with a history of dermatological fillers)

The most frequent adverse reactions during clinical trials in those aged ≥18 years were injection site pain (>90%), fatigue (70%), headache (>60%), myalgia (>60%), arthralgia (> 40%), chills (>40%), nausea and vomiting (>20%), axillary swelling/ tenderness, pyrexia and injection site swelling (>15%), which were usually mild or moderate in intensity and resolved within a few days after vaccination. A slightly lower frequency of adverse events was associated with greater age.

A lower frequency of adverse events is associated with greater age. A higher rate of local and systemic adverse events are seen after the second dose.

Post marketing surveillance has reported an anaphylaxis rate of 2-5/ million in the US and 21/million in the UK (the latter figure includes anaphylactoid reactions). These rates are higher than after non COVID-19 vaccines.

Co-administration
COVID-19 vaccines and other vaccines may be administered at the same time or at any interval.

As it is not known if COVID-19 vaccine reactogenicity is increased with co-administration, vaccines should preferably be given in different limbs.

Duration of immunity
There is insufficient information to determine the duration of protection from the vaccine.

Vaccine recipients may not have optimal protection until 14 days after the second dose, and the vaccine may not protect all vaccinees.

Vaccinated persons should continue to follow current public health guidance to protect themselves and others.

Booster doses
The need for and timing of booster doses has not been established.

Viral vector vaccines

Table 5a.4: Vaccination of those due a COVID-19 viral vector vaccine

	History	Action
Contraindication	• Anaphylaxis after a previous dose of Vaxzevria® • Anaphylaxis after polysorbate 80	Consider vaccination with Comirnaty® or Spikevax® (formerly COVID-19 vaccine Moderna®) in a suitable facility Observe for 30 minutes or Discuss with allergist/ immunologist
Special precautions	• Anaphylaxis after a vaccine, injected antibody preparation, or a medicine known to contain polysorbate 80 • Unexplained anaphylaxis (may indicate polysorbate 80 allergy)	Clarify if polysorbate 80 is tolerated (see FAQs) Discuss with allergist/ immunologist Consider vaccination with Comirnaty® or Spikevax® (formerly COVID-19 vaccine Moderna®) Observe for 30 minutes
	• Mastocytosis • Idiopathic anaphylaxis • Anaphylaxis after food, venom or medication	Vaccinate as scheduled Observe for 30 minutes
Not a contraindication or a precaution	• Non-anaphylactic food allergy • Family history of allergy, including anaphylaxis • Previous local reaction to any vaccine • Hereditary angioedema • Contact dermatitis to polysorbate 80 containing cosmetic product • Underlying asthma • Hay fever • NSAID allergy • Chronic spontaneous urticaria	Vaccinate as scheduled Observe for 15 minutes

Vaxzevria® (formerly COVID-19 Vaccine AstraZeneca®)

This medicinal product is subject to additional monitoring. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse reactions to the HPRA.

The vaccine should be stored at +2°C to +8°C. Each pack contains 10 vials.

The vaccine does not require dilution. Once the multidose vial is punctured, the vaccine should be used immediately. If not used, it may kept for a single period for up to 30°C and used within 6 hours or between +2°C to +8°C and used within 48 hours.

Licensed indications
Active immunisation to prevent COVID-19 caused by SARS-CoV-2 virus, in individuals 18 years of age and older.

Vaccine efficacy
Clinical trial data demonstrated a two-dose vaccine efficacy of 59.5% (95% confidence interval of 45.8% to 69.7%) in those aged 18 and above. There was insufficient clinical data to allow reliable calculation of efficacy in those aged 55 and older. However, as a similar immune response was shown in all age groups, including those aged 65 and older, the EMA authorised the vaccine for all adults.

The World Health Organization (WHO) Strategic Advisory Group of Experts (SAGE), subsequently reported the overall vaccine efficacy at 63.1%. There were no cases of COVID-19 hospitalisation, severe disease, or death in those aged 65 and older who received the vaccine.

Vaccine effectiveness
A prospective population study of 5.4 million people from Scotland found that the first dose of vaccine showed effectiveness of 94% (95% CI 73 to 99) for COVID-19 related hospitalisation at 28-34 days post-vaccination. This effectiveness may not apply to all variants.

Dose, route and schedule
The dose of vaccine is 0.5 ml IM, preferably into the deltoid muscle. The vaccine is authorised as a two dose course 4-12 weeks apart.

If more than ten 0.5ml doses can be safely and accurately withdrawn from a vial, they can be used as valid vaccines. There should be no pooling of the contents of different vials.

It is generally recommended the two doses are given 8-12 weeks apart because there is evidence which shows that higher efficacy of 82% was reported when the second dose was given after 12 weeks.

The threat of new variants in circulation and evidence of suboptimal protection against the delta variant after one dose of Vaxzevria® means that the shorter 4-week interval is preferable to ensure earlier protection, if practicable.

If the interval between doses is longer than 12 weeks, the second dose should be given as soon as possible. The course does not need to be restarted.

The minimum interval is 4 weeks (28 days). If the second dose was given between 24 and 27 days after the first dose, it is a valid dose. If the second dose is given before 24 days, this is not considered a valid vaccine. A third dose should be given 28 days after the second (invalid) vaccine.

Interchangeability
There is insufficient data on the interchangeability of Vaxzevria® and other COVID-19 vaccines. The same vaccine should be used for both doses.

Consideration may be given to mRNA vaccination after anaphylaxis to a dose of this vaccine. The mRNA vaccine should be given after an interval of at least 28 days.

Contraindications (see Table 5a.4)
Anaphylaxis (serious systemic allergic reaction requiring medical intervention) following a previous dose of the vaccine or any of its constituents (including polysorbate 80).

A second dose of Vaxzevria® should not be given to anyone who developed Thrombosis with Thrombocytopenia Syndrome (TTS) after the first dose (see Section 5a.4.2).

Previous history of capillary leak syndrome.

Those with a contraindication to one viral vector COVID-19 vaccine should not receive another authorised viral vector vaccine. Consideration may be given to mRNA vaccination which should be given after an interval of at least 28 days.

Appropriate support should be available in case of anaphylaxis or fainting after vaccine administration.

Precautions should be in place to minimise injury from fainting.

Precautions (see Table 5a.4)
Acute severe febrile illness; defer until recovery.

Consider mRNA vaccination for those with:

- Anaphylaxis after a vaccine, injected antibody preparation, or a medicine known to contain polysorbate 80
- Unexplained anaphylaxis (may indicate polysorbate 80 allergy).

If vaccination is advised, in a patient with prior anaphylaxis to an unrelated allergen, the patient should be observed for 30 minutes after vaccination.

For more information see Frequently Asked Questions about COVID-19 vaccines for people with pre-existing allergic conditions.

Those aged **under 50 years** including those with medical conditions with very high or high risk of severe COVID-19 disease should be given an mRNA vaccine, unless they have received one dose of Vaxzevria®; in that case they should receive their second dose as scheduled.

When COVID-19 rates are high or increasing and/or the availability of mRNA vaccines is limited, Vaxzevria® may be recommended for those aged 18-49 years to provide early protection.

Healthy people aged 40-49 years may choose to avail of an earlier Vaxzevria® vaccine provided they have made an informed decision. This decision should be based on their understanding of the risk of developing thrombosis with thrombocytopenia syndrome (TTS) compared with the consequences of COVID-19 infection, the options of other effective public health measures and the benefits of a sooner vaccine.

Patients with planned immunosuppressive therapy should ideally complete vaccination two weeks before treatment. The recommended minimum interval may be used. Specialists should consider the individual's risk and likelihood of disease exposure, and provide advice based on knowledge and understanding of the patient's immune status and likely immune response to vaccination.

Vaccination after COVID-19
Those with persisting symptoms post COVID-19 may be vaccinated, unless there is evidence of recent clinical deterioration.

Vaccination should be deferred until clinical recovery from COVID-19 infection and for at least four weeks after diagnosis or onset of symptoms, or four weeks from the first PCR positive specimen in those who are asymptomatic.

Those aged under 65 years who are not immunocompromised
Vaccination may be deferred for up to nine months after diagnosis, symptom onset, or from the first PCR or antigen positive specimen.

Those who have had previous laboratory confirmed COVID-19 infection within 9 months:

- aged *50 years and older* should receive a full COVID-19 vaccine schedule
- aged *under 50 years and immunocompromised* should receive a full COVID-19 vaccine schedule
- aged *under 50 years and immunocompetent*: a single dose of COVID-19 vaccine is sufficient and they should then be considered fully vaccinated,

Those who have had laboratory confirmed COVID-19 infection within 9 months after a first dose of COVID-19 vaccine should complete the vaccine course.

Post vaccination observation period

- Those with no history of anaphylaxis: 15 minutes
- Those with a history of anaphylaxis from any cause: 30 minutes
- Those with immediate itching, swelling or urticarial reaction at the vaccination site: 30 minutes or longer as clinically indicated

Immunocompromised

Data are not currently available to establish vaccine safety or efficacy in these groups. Individuals with immunosuppression due to disease or treatment may be vaccinated if they have no contraindications.

Pregnancy

This vaccine is not recommended for those aged under 50 years, including those with medical conditions with very high or high risk of severe COVID-19 disease.

See Precautions section for those who have received a first dose.

Breastfeeding

There is no known reason for vaccinees to avoid breastfeeding.

Children and adolescents under 18 years of age

There are no data available on vaccine safety and efficacy in children.

Vaccination of those with bleeding disorders or on anticoagulants

Individuals with a bleeding disorder or receiving anticoagulant therapy may develop haematomas in IM injection sites. Prior to vaccination, inform the recipient about this risk. For those with thrombocytopenia (platelet count<$50x10^9$/L), consult the supervising consultant. People with mild bleeding disorders or on maintenance dose Emicizumab (Hemlibra®) do not require haemostatic cover for vaccination. Details of haemostatic cover for all others can be found in the Patient Information tab at http://www.stjames.ie/services/hope/nationalcoagulationcentre

Those with inherited coagulopathies who require factor replacement therapy should receive it on the day of vaccination, prior to the IM vaccination.

If there is uncertainty about the need for cover, contact the patient's Comprehensive Care Centre.

Those receiving long-term anticoagulation with either Warfarin® or heparin are not considered to be at higher risk of bleeding complications following vaccination. There is no reason to expect that there is a greater risk of bleeding complications with the newer direct oral anticoagulants or antiplatelet agents, than with other anticoagulants.

People on Warfarin® should follow their usual schedule for international normalised ratio (INR) testing and can be vaccinated if it is less than 4.0.

If the INR is 4.0 or more, follow the advice of the clinic/practice managing Warfarin® and wait until the INR is less than 4.0 to be vaccinated.

See Chapter 2, sections 2.4.6 and 2.4.7 for further information, including technique for IM injection, in this patient group.

Adverse reactions
A full list of adverse reactions may be found in the Summary of Product Characteristics (SmPC).

Terms used for frequency of adverse events
Very common: >1/10
Common: >1/100 and <1/10
Uncommon: >1/1,000 and <1/100
Rare: >1/10,000 and <1/1,000
Very rare: <1/10,000

Local: Very common: injection site bruising, pain, pruritus, tenderness, warmth
Common: injection site erythema, swelling
Uncommon: injection site haematoma

General: Very common: arthralgia, chills, fatigue, feverishness, headache, malaise, myalgia, nausea
Common: diarrhoea, fever ≥38°C, thrombocytopenia (asymptomatic), vomiting
Uncommon: decreased appetite, dizziness, hyperhidrosis, lymphadenopathy, pruritus, somnolence, rash
Very rare: thrombosis in combination with thrombocytopenia (see Section 5a.4.2), capillary leak syndrome

The most frequent adverse reactions during clinical trials in those aged ≥18 years were injection site tenderness (>60%), fatigue, headache, injection site pain (50%), malaise, myalgia (>40%), chills, feverishness, pyrexia (>30%) and arthralgia and nausea (>20%).

A lower frequency of adverse events is associated with greater age. The rate and severity of local and systemic adverse reactions is lower after the second dose.

Post marketing surveillance in the UK has reported an anaphylaxis rate of 17/million (the figure includes anaphylactoid reactions). This rate is higher than after non COVID-19 vaccines.

Co-administration
COVID-19 vaccines and other vaccines may be administered at the same time or at any interval.

As it is not known if COVID-19 vaccine reactogenicity is increased with co-administration, vaccines should preferably be given in different limbs.

Duration of immunity
There is insufficient information to determine the duration of protection from the vaccine.

Protection starts from approximately three weeks after first dose of vaccine with 76% protection overall against symptomatic COVID-19 disease for up to 90 days (12 weeks). There is no evidence of significant waning of protection for up to 16 weeks after vaccination. Higher efficacy of 82% was reported when the second dose was given after 12 weeks.

Vaccine recipients may not have optimal protection until 15 days after the second dose, and the vaccine may not protect all vaccinees.

Vaccinated persons should continue to follow current public health guidance to protect themselves and others.

Booster doses
The need for, and timing of booster doses has not been established.

COVID-19 Vaccine Janssen®

This medicinal product is subject to additional monitoring. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse reactions to the HPRA.

The vaccine should be stored at +2°C to +8°C. Each pack contains 10 vials.

The vaccine does not require dilution.
After the first dose has been withdrawn, the vaccine should be used immediately. If not used, the vial can be maintained between 2° to 8°C for up to 6 hours or at room temperature (up to 25°C) for up to 3 hours. Discard the vial if vaccine is not used within these times.

Licensed indications
Active immunisation to prevent COVID-19 caused by SARS-CoV-2 virus, in individuals 18 years of age and older.

Vaccine efficacy
Clinical trial data demonstrated a vaccine efficacy against severe COVID-19 disease of 76.7% (95% confidence interval 54.6% to 89.1%) 14 days after vaccination, increasing to 85.4% (95% confidence interval 54.2% to 96.9%) 28 days in those aged 18 and above. High efficacy was observed across age and sex, and among persons with underlying medical conditions. This efficacy may not apply to all variants.

Dose and route of administration
The dose of vaccine is 0.5 ml IM, preferably into the deltoid muscle.

The course consists of one 0.5 ml dose.

If more than five 0.5ml doses can be safely and accurately withdrawn from a vial, they can be used as valid vaccines.

Interchangeability
The vaccine may be used as the second dose for a person who had anaphylaxis to an mRNA vaccine.

Contraindications (see Table 5a.4)
Anaphylaxis (serious systemic allergic reaction requiring medical intervention) following a previous dose of the vaccine or any of its constituents (including polysorbate 80).

Anaphylaxis following another viral vector vaccine.

Thrombosis with Thrombocytopenia Syndrome (TTS) after the first dose of another viral vector COVID-19 vaccine (see Section 5a.4.2).

Appropriate support should be available in case of anaphylaxis or fainting after vaccine administration.

Precautions should be in place to minimise injury from fainting.

Precautions
Acute severe febrile illness; defer until recovery.

Consider mRNA vaccination for those with:

- Anaphylaxis after a vaccine, injected antibody preparation, or a medicine known to contain polysorbate 80
- Unexplained anaphylaxis (may indicate polysorbate 80 allergy).

If vaccination is advised, in a patient with prior anaphylaxis to an unrelated allergen, the patient should be observed for 30 minutes after vaccination.

mRNA vaccines are recommended for those aged **under 50 years** including those with medical conditions with very high or high risk of severe COVID-19 disease.

In circumstances where a two-dose mRNA vaccination schedule is not a feasible alternative, when COVID-19 rates are high or increasing and/or the availability of mRNA vaccines is limited, COVID-19 vaccine Janssen® can be considered for those aged 18 – 49 years.

Healthy people aged 40-49 years may choose to avail of an earlier COVID-19 Vaccine Janssen® vaccine provided they have made an informed decision. This decision should be based on their understanding of the risk of developing TTS compared with the consequences of COVID-19 infection, the options of other effective public health measures and the benefits of a sooner vaccine.

Advice from a relevant specialist should be sought for a person with a history of an immediate severe allergic reaction to multiple drug classes with no identified allergen, any other vaccine injected antibody preparation or medicine likely to contain polysorbate 80 or idiopathic anaphylaxis and the risks should be weighed against the benefits of vaccination.

Patients with planned immunosuppressive therapy should ideally receive vaccination two weeks before treatment. Specialists should consider the individual's risk and likelihood of disease exposure, and provide advice based on knowledge and understanding of the patient's immune status and likely immune response to vaccination.

Vaccination after COVID-19
Those with persisting symptoms post COVID-19 may be vaccinated, unless there is evidence of recent clinical deterioration.

Vaccination should be deferred until clinical recovery from COVID-19 infection and for at least four weeks after diagnosis or onset of symptoms, or four weeks from the first PCR positive specimen in those who are asymptomatic.

Those aged under 65 years who are not immunocompromised
Vaccination may be deferred for up to nine months after diagnosis, symptom onset, or from the first PCR or antigen positive specimen.

Post vaccination observation period
- Those with no history of anaphylaxis: 15 minutes
- Those with a history of anaphylaxis from any cause: 30 minutes
- Those with immediate itching, swelling or urticarial reaction at the vaccination site: 30 minutes or longer as clinically indicated

Immunocompromised
Data are not currently available to establish vaccine safety and efficacy in these groups. Individuals with immunosuppression due to disease or treatment may be vaccinated if they have no contraindications.

Pregnancy
This vaccine is not recommended for pregnant women including those with medical conditions with very high or high risk of severe COVID-19 disease.

Breastfeeding
There is no known reason for vaccinees to avoid breastfeeding. Breastfeeding mothers should be vaccinated according to their risk grouping.

Children and adolescents under 18 years of age
There is no data available on vaccine safety and efficacy in children.

Vaccination of those with bleeding disorders or on anticoagulants
Individuals with a bleeding disorder or receiving anticoagulant therapy may develop haematomas in IM injection sites. Prior to vaccination, inform the recipient about this risk. For those with thrombocytopenia (platelet count<$50x10^9$/L), consult the supervising consultant. People with mild

bleeding disorders or on maintenance dose Emicizumab (Hemlibra®) do not require haemostatic cover for vaccination. Details of haemostatic cover for all others can be found in the Patient Information tab at http://www.stjames.ie/services/hope/nationalcoagulationcentre

Those with inherited coagulopathies who require factor replacement therapy should receive it on the day of vaccination, prior to the IM vaccination. If there is uncertainty about the need for cover, contact the patient's Comprehensive Care Centre.

Those receiving long-term anticoagulation with either Warfarin® or heparin are not considered to be at higher risk of bleeding complications following vaccination. There is no reason to expect that there is a greater risk of bleeding complications with the newer oral anticoagulants or antiplatelet agents, than with other anticoagulants.

Those on Warfarin® should follow their usual schedule for international normalised ratio (INR) testing and can be vaccinated if it is less than 4.0. If the INR is 4.0 or more, follow the advice of the clinic/practice managing Warfarin® and wait until the INR is less than 4.0 to be vaccinated.

See Chapter 2, sections 2.4.6 and 2.4.7 for further information, including technique for IM injection, in this patient group.

Adverse reactions
A full list of adverse reactions may be found in the Summary of Product Characteristics (SmPC).

Terms used for frequency of adverse events

Very common:	>1/10
Common:	>1/100 and <1/10
Uncommon:	>1/1,000 and <1/100
Rare:	>1/10,000 and <1/1,000
Very rare:	<1/10,000

Local:	Very common: injection site pain
	Common: injection site erythema, swelling
General:	Very common: fatigue, headache, myalgia, nausea
	Common: arthralgia, chills, cough, pyrexia
	Uncommon: asthenia, back pain, hyperhidrosis, malaise, muscular weakness, oropharyngeal pain, pain in extremity, rash, sneezing, tremor
	Rare: hypersensitivity, urticaria
	Very rare: thrombosis with thrombocytopenia (see Section 5a.4.2)

The most frequent adverse reactions during clinical trials in those aged ≥18 years were injection site pain (> 40%), fatigue, headache, myalgia (> 30%), nausea (>10%) and fever (9%). A lower frequency and severity of adverse events was associated with greater age.

Co-administration
COVID-19 vaccines and other vaccines may be administered at the same time or at any interval.

As it is not known if COVID-19 vaccine reactogenicity is increased with co-administration, vaccines should preferably be given in different limbs.

Duration of immunity
There is insufficient information to determine the duration of protection from the vaccine.

Vaccinated persons should continue to follow all current public health guidance to protect themselves and others.

Booster doses
The need for, and timing of booster doses has not been established.

5a.6 Post-marketing surveillance (Pharmacovigilance)

The HPRA is responsible for managing the national pharmacovigilance system. The HPRA reports nationally occurring adverse reactions to the EMA. Adverse reaction reporting is an important part of the EMA intensive monitoring plan for COVID-19 vaccines, so that any changes in benefit risk balance can be promptly detected and acted upon. This enables the EMA to continue to safeguard public health safety.

Healthcare professionals and members of the public are encouraged to report suspected adverse reactions to the HPRA following the instructions available on the HPRA website www.hpra.ie

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