Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

COVID-19

Selected Adverse Events Reported after COVID-19 Vaccination

Updated Mar. 14, 2022

Safety of COVID-19 Vaccines

Some people have no side effects. Many people have reported side effects that are generally mild to moderate and go away within a few days.

What You Need to Know

- COVID-19 vaccines are **safe and effective**.
- CDC recommends everyone ages 5 years and older get vaccinated as soon as possible to protect against COVID-19 and its potentially severe complications. CDC has updated its recommendation for COVID-19 vaccines with a preference for mRNA vaccines (Pfizer-BioNTech and Moderna).
- Millions of people in the United States have received COVID-19 vaccines under the most intense safety monitoring program in U.S. history.
- CDC, the U.S. Food and Drug Administration (FDA), and other federal agencies continue to monitor the safety of COVID-19 vaccines.
- Adverse events described on this page have been reported to the Vaccine Adverse Event Reporting System (VAERS) .
- VAERS accepts reports of any adverse event following vaccination.

Serious adverse events after COVID-19 vaccination are rare but may occur.

CDC is providing timely updates on the following serious adverse events of interest:

- **Anaphylaxis after COVID-19 vaccination is rare** and has occurred in approximately 5 people per one million vaccinated in the United States. Anaphylaxis,

a severe type of allergic reaction, can occur after any kind of vaccination. If it happens, healthcare providers can effectively and immediately treat the reaction. Learn more about COVID-19 vaccines and allergic reactions, including anaphylaxis.

- **Thrombosis with thrombocytopenia syndrome (TTS) after Johnson & Johnson's Janssen (J&J/Janssen) COVID-19 vaccination is rare.** TTS is a rare but serious adverse event that causes blood clots in large blood vessels and low platelets (blood cells that help form clots). As of March 10, 2022, more than 18.5 million doses of the J&J/Janssen COVID-19 vaccine have been given in the United States. CDC and FDA identified 59 confirmed reports of people who got the J&J/Janssen COVID-19 vaccine and later developed TTS.

  CDC has also identified nine deaths that have been caused by or were directly attributed to TTS following J&J/Janssen COVID-19 vaccination. Women ages 30-49 years, especially, should be aware of the increased risk of this rare adverse event. There are other COVID-19 vaccine options available for which this risk has not been seen.

  - To date, four confirmed cases of TTS following mRNA COVID-19 vaccination (3 after Moderna, 1 after Pfizer-BioNTech) have been reported to VAERS after more than 537 million doses of mRNA COVID-19 vaccines administered in the United States. Based on available data, there is not an increased risk for TTS after mRNA COVID-19 vaccination.

- **Guillain-Barré Syndrome (GBS) in people who have received the J&J/Janssen COVID-19 vaccine is rare.** GBS is a rare disorder where the body's immune system damages nerve cells, causing muscle weakness and sometimes paralysis. Most people fully recover from GBS, but some have permanent nerve damage. After more than 18.5 million J&J/Janssen COVID-19 vaccine doses administered, there have been around 307 preliminary reports of GBS identified in VAERS as of March 10, 2022. These cases have largely been reported about 2 weeks after vaccination and mostly in men, many in those ages 50 years and older.

  Based on the data, the rate of GBS within the first 21 days following J&J/Janssen COVID-19 vaccination was found to be 21 times higher than after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). After the first 42 days, the rate of GBS was 11 times higher following J&J/Janssen COVID-19 vaccination. Analysis found no increased risk of GBS after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). CDC and FDA will continue to monitor for and evaluate reports of GBS occurring after COVID-19 vaccination and will share more information as it becomes available.

- **Myocarditis and pericarditis after COVID-19 vaccination are rare.** Myocarditis is inflammation of the heart muscle, and pericarditis is inflammation of the outer lining of the heart. Most patients with myocarditis or pericarditis after COVID-19 vaccination responded well to medicine and rest and felt better quickly. As of March 10, 2022, VAERS has received 2,296 preliminary reports of myocarditis or pericarditis among people ages 30 years and younger who received COVID-19 vaccines.

  Most cases have been reported after receiving Pfizer-BioNTech or Moderna, (mRNA COVID-19 vaccines) particularly in male adolescents and young adults. Through

follow-up, including medical record reviews, CDC and FDA have verified 1,367 reports of myocarditis or Learn more about myocarditis and pericarditis, including clinical considerations, after mRNA COVID-19 vaccination.

- **Reports of death after COVID-19 vaccination are rare.** FDA requires healthcare providers to report any death after COVID-19 vaccination to VAERS, even if it's unclear whether the vaccine was the cause. **Reports of adverse events to VAERS following vaccination, including deaths, do not necessarily mean that a vaccine caused a health problem.** More than 557 million doses of COVID-19 vaccines were administered in the United States from December 14, 2020, through March 14, 2022. During this time, VAERS received 13,273 preliminary reports of death (0.0024%) among people who received a COVID-19 vaccine. CDC and FDA clinicians review reports of death to VAERS including death certificates, autopsy, and medical records.

A review of reports indicates a causal relationship between the J&J/Janssen COVID-19 vaccine and TTS. CDC scientists have conducted detailed reviews of TTS cases and made the information available to healthcare providers and the public:

- US Case Reports of Cerebral Venous Sinus Thrombosis With Thrombocytopenia After Ad26.COV2.S Vaccination, March 2 to April 21, 2021
- Case Series of Thrombosis with Thrombocytopenia Syndrome following COVID-19 vaccination—United States, December 2020–August 2021
- Updates on Thrombosis with Thrombocytopenia Syndrome (TTS) [1.3 MB, 39 Pages]

Continued monitoring has identified nine deaths causally associated with J&J/Janssen COVID-19 vaccination. CDC and FDA continue to review reports of death following COVID-19 vaccination and update information as it becomes available.

Related Pages

- Safety of COVID-19 Vaccines
- Vaccine Adverse Event Reporting System (VAERS): What Reports Mean and How VAERS Works

Last Updated Mar. 14, 2022
Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

COVID-19

Selected Adverse Events Reported after COVID-19 Vaccination

Updated Mar. 21, 2022

Safety of COVID-19 Vaccines

Some people have no side effects. Many people have reported side effects that are generally mild to moderate and go away within a few days.

What You Need to Know

- COVID-19 vaccines are **safe and effective**.
- CDC recommends everyone ages 5 years and older get vaccinated as soon as possible to protect against COVID-19 and its potentially severe complications. CDC has updated its recommendation for COVID-19 vaccines with a preference for mRNA vaccines (Pfizer-BioNTech and Moderna).
- Millions of people in the United States have received COVID-19 vaccines under the most intense safety monitoring program in U.S. history.
- CDC, the U.S. Food and Drug Administration (FDA), and other federal agencies continue to monitor the safety of COVID-19 vaccines.
- Adverse events described on this page have been reported to the Vaccine Adverse Event Reporting System (VAERS) .
- VAERS accepts reports of any adverse event following vaccination.

Serious adverse events after COVID-19 vaccination are rare but may occur.

CDC is providing timely updates on the following serious adverse events of interest:

- **Anaphylaxis after COVID-19 vaccination is rare** and has occurred in approximately 5 people per one million vaccinated in the United States. Anaphylaxis,

a severe type of allergic reaction, can occur after any kind of vaccination. If it happens, healthcare providers can effectively and immediately treat the reaction. Learn more about COVID-19 vaccines and allergic reactions, including anaphylaxis.

- **Thrombosis with thrombocytopenia syndrome (TTS) after Johnson & Johnson's Janssen (J&J/Janssen) COVID-19 vaccination is rare.** TTS is a rare but serious adverse event that causes blood clots in large blood vessels and low platelets (blood cells that help form clots). As of March 17, 2022, more than 18.5 million doses of the J&J/Janssen COVID-19 vaccine have been given in the United States. CDC and FDA identified 60 confirmed reports of people who got the J&J/Janssen COVID-19 vaccine and later developed TTS.

  CDC has also identified nine deaths that have been caused by or were directly attributed to TTS following J&J/Janssen COVID-19 vaccination. Women ages 30-49 years, especially, should be aware of the increased risk of this rare adverse event. There are other COVID-19 vaccine options available for which this risk has not been seen.

  - To date, four confirmed cases of TTS following mRNA COVID-19 vaccination (3 after Moderna, 1 after Pfizer-BioNTech) have been reported to VAERS after more than 538 million doses of mRNA COVID-19 vaccines administered in the United States. Based on available data, there is not an increased risk for TTS after mRNA COVID-19 vaccination.

- **Guillain-Barré Syndrome (GBS) in people who have received the J&J/Janssen COVID-19 vaccine is rare.** GBS is a rare disorder where the body's immune system damages nerve cells, causing muscle weakness and sometimes paralysis. Most people fully recover from GBS, but some have permanent nerve damage. After more than 18.5 million J&J/Janssen COVID-19 vaccine doses administered, there have been around 310 preliminary reports of GBS identified in VAERS as of March 17, 2022. These cases have largely been reported about 2 weeks after vaccination and mostly in men, many in those ages 50 years and older.

  Based on the data, the rate of GBS within the first 21 days following J&J/Janssen COVID-19 vaccination was found to be 21 times higher than after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). After the first 42 days, the rate of GBS was 11 times higher following J&J/Janssen COVID-19 vaccination. Analysis found no increased risk of GBS after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). CDC and FDA will continue to monitor for and evaluate reports of GBS occurring after COVID-19 vaccination and will share more information as it becomes available.

- **Myocarditis and pericarditis after COVID-19 vaccination are rare.** Myocarditis is inflammation of the heart muscle, and pericarditis is inflammation of the outer lining of the heart. Most patients with myocarditis or pericarditis after COVID-19 vaccination responded well to medicine and rest and felt better quickly. As of March 17, 2022, VAERS has received 2,309 preliminary reports of myocarditis or pericarditis among people ages 30 years and younger who received COVID-19 vaccines.

  Most cases have been reported after receiving Pfizer-BioNTech or Moderna, (mRNA COVID-19 vaccines) particularly in male adolescents and young adults. Through

follow-up, including medical record reviews, CDC and FDA have verified 1,390 reports of myocarditis or Learn more about myocarditis and pericarditis, including clinical considerations, after mRNA COVID-19 vaccination.

- **Reports of death after COVID-19 vaccination are rare.** FDA requires healthcare providers to report any death after COVID-19 vaccination to VAERS, even if it's unclear whether the vaccine was the cause. **Reports of adverse events to VAERS following vaccination, including deaths, do not necessarily mean that a vaccine caused a health problem.** More than 558 million doses of COVID-19 vaccines were administered in the United States from December 14, 2020, through March 21, 2022. During this time, VAERS received 13,434 preliminary reports of death (0.0024%) among people who received a COVID-19 vaccine. CDC and FDA clinicians review reports of death to VAERS including death certificates, autopsy, and medical records.

  A review of reports indicates a causal relationship between the J&J/Janssen COVID-19 vaccine and TTS. CDC scientists have conducted detailed reviews of TTS cases and made the information available to healthcare providers and the public:

  - US Case Reports of Cerebral Venous Sinus Thrombosis With Thrombocytopenia After Ad26.COV2.S Vaccination, March 2 to April 21, 2021
  - Case Series of Thrombosis with Thrombocytopenia Syndrome following COVID-19 vaccination—United States, December 2020–August 2021
  - Updates on Thrombosis with Thrombocytopenia Syndrome (TTS) [1.3 MB, 39 Pages]

  Continued monitoring has identified nine deaths causally associated with J&J/Janssen COVID-19 vaccination. CDC and FDA continue to review reports of death following COVID-19 vaccination and update information as it becomes available.

Related Pages

- Safety of COVID-19 Vaccines
- Vaccine Adverse Event Reporting System (VAERS): What Reports Mean and How VAERS Works

Last Updated Mar. 21, 2022
Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

COVID-19

Selected Adverse Events Reported after COVID-19 Vaccination

Updated Mar. 28, 2022

Safety of COVID-19 Vaccines

Some people have no side effects. Many people have reported side effects that are generally mild to moderate and go away within a few days.

What You Need to Know

- COVID-19 vaccines are **safe and effective**.
- CDC recommends everyone ages 5 years and older get vaccinated as soon as possible to protect against COVID-19 and its potentially severe complications. CDC has updated its recommendation for COVID-19 vaccines with a preference for mRNA vaccines (Pfizer-BioNTech and Moderna).
- Millions of people in the United States have received COVID-19 vaccines under the most intense safety monitoring program in U.S. history.
- CDC, the U.S. Food and Drug Administration (FDA), and other federal agencies continue to monitor the safety of COVID-19 vaccines.
- Adverse events described on this page have been reported to the Vaccine Adverse Event Reporting System (VAERS) .
- VAERS accepts reports of any adverse event following vaccination.

Serious adverse events after COVID-19 vaccination are rare but may occur.

CDC is providing timely updates on the following serious adverse events of interest:

- **Anaphylaxis after COVID-19 vaccination is rare** and has occurred in approximately 5 people per one million vaccinated in the United States. Anaphylaxis,

a severe type of allergic reaction, can occur after any kind of vaccination. If it happens, healthcare providers can effectively and immediately treat the reaction. Learn more about COVID-19 vaccines and allergic reactions, including anaphylaxis.

- **Thrombosis with thrombocytopenia syndrome (TTS) after Johnson & Johnson's Janssen (J&J/Janssen) COVID-19 vaccination is rare.** TTS is a rare but serious adverse event that causes blood clots in large blood vessels and low platelets (blood cells that help form clots). As of March 24, 2022, more than 18.5 million doses of the J&J/Janssen COVID-19 vaccine have been given in the United States. CDC and FDA identified 60 confirmed reports of people who got the J&J/Janssen COVID-19 vaccine and later developed TTS.

  CDC has also identified nine deaths that have been caused by or were directly attributed to TTS following J&J/Janssen COVID-19 vaccination. Women ages 30-49 years, especially, should be aware of the increased risk of this rare adverse event. There are other COVID-19 vaccine options available for which this risk has not been seen.

  - To date, four confirmed cases of TTS following mRNA COVID-19 vaccination (3 after Moderna, 1 after Pfizer-BioNTech) have been reported to VAERS after more than 540 million doses of mRNA COVID-19 vaccines administered in the United States. Based on available data, there is not an increased risk for TTS after mRNA COVID-19 vaccination.

- **Guillain-Barré Syndrome (GBS) in people who have received the J&J/Janssen COVID-19 vaccine is rare.** GBS is a rare disorder where the body's immune system damages nerve cells, causing muscle weakness and sometimes paralysis. Most people fully recover from GBS, but some have permanent nerve damage. After more than 18.5 million J&J/Janssen COVID-19 vaccine doses administered, there have been around 310 preliminary reports of GBS identified in VAERS as of March 24, 2022. These cases have largely been reported about 2 weeks after vaccination and mostly in men, many in those ages 50 years and older.

  Based on the data, the rate of GBS within the first 21 days following J&J/Janssen COVID-19 vaccination was found to be 21 times higher than after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). After the first 42 days, the rate of GBS was 11 times higher following J&J/Janssen COVID-19 vaccination. Analysis found no increased risk of GBS after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). CDC and FDA will continue to monitor for and evaluate reports of GBS occurring after COVID-19 vaccination and will share more information as it becomes available.

- **Myocarditis and pericarditis after COVID-19 vaccination are rare.** Myocarditis is inflammation of the heart muscle, and pericarditis is inflammation of the outer lining of the heart. Most patients with myocarditis or pericarditis after COVID-19 vaccination responded well to medicine and rest and felt better quickly. As of March 24, 2022, VAERS has received 2,323 preliminary reports of myocarditis or pericarditis among people ages 30 years and younger who received COVID-19 vaccines.

  Most cases have been reported after receiving Pfizer-BioNTech or Moderna, (mRNA COVID-19 vaccines) particularly in male adolescents and young adults. Through

follow-up, including medical record reviews, CDC and FDA have verified 1,396 reports of myocarditis or Learn more about myocarditis and pericarditis, including clinical considerations, after mRNA COVID-19 vaccination.

- **Reports of death after COVID-19 vaccination are rare.** FDA requires healthcare providers to report any death after COVID-19 vaccination to VAERS, even if it's unclear whether the vaccine was the cause. **Reports of adverse events to VAERS following vaccination, including deaths, do not necessarily mean that a vaccine caused a health problem.** More than 559 million doses of COVID-19 vaccines were administered in the United States from December 14, 2020, through March 28, 2022. During this time, VAERS received 13,637 preliminary reports of death (0.0024%) among people who received a COVID-19 vaccine. CDC and FDA clinicians review reports of death to VAERS including death certificates, autopsy, and medical records.

A review of reports indicates a causal relationship between the J&J/Janssen COVID-19 vaccine and TTS. CDC scientists have conducted detailed reviews of TTS cases and made the information available to healthcare providers and the public:

- US Case Reports of Cerebral Venous Sinus Thrombosis With Thrombocytopenia After Ad26.COV2.S Vaccination, March 2 to April 21, 2021
- Case Series of Thrombosis with Thrombocytopenia Syndrome following COVID-19 vaccination—United States, December 2020–August 2021
- Updates on Thrombosis with Thrombocytopenia Syndrome (TTS) [1.3 MB, 39 Pages]

Continued monitoring has identified nine deaths causally associated with J&J/Janssen COVID-19 vaccination. CDC and FDA continue to review reports of death following COVID-19 vaccination and update information as it becomes available.

Related Pages

- Safety of COVID-19 Vaccines
- Vaccine Adverse Event Reporting System (VAERS): What Reports Mean and How VAERS Works

Last Updated Mar. 28, 2022
Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

COVID-19

Selected Adverse Events Reported after COVID-19 Vaccination

Updated Apr. 4, 2022

Safety of COVID-19 Vaccines

Some people have no side effects. Many people have reported side effects that are generally mild to moderate and go away within a few days.

What You Need to Know

- COVID-19 vaccines are **safe and effective**.
- CDC recommends everyone ages 5 years and older get vaccinated as soon as possible to protect against COVID-19 and its potentially severe complications. CDC has updated its recommendation for COVID-19 vaccines with a preference for mRNA vaccines (Pfizer-BioNTech and Moderna).
- Millions of people in the United States have received COVID-19 vaccines under the most intense safety monitoring program in U.S. history.
- CDC, the U.S. Food and Drug Administration (FDA), and other federal agencies continue to monitor the safety of COVID-19 vaccines.
- Adverse events described on this page have been reported to the Vaccine Adverse Event Reporting System (VAERS) .
- VAERS accepts reports of any adverse event following vaccination.

Serious adverse events after COVID-19 vaccination are rare but may occur.

CDC is providing timely updates on the following serious adverse events of interest:

- **Anaphylaxis after COVID-19 vaccination is rare** and has occurred in approximately 5 people per one million vaccinated in the United States. Anaphylaxis,

a severe type of allergic reaction, can occur after any kind of vaccination. If it happens, healthcare providers can effectively and immediately treat the reaction. Learn more about COVID-19 vaccines and allergic reactions, including anaphylaxis.

- **Thrombosis with thrombocytopenia syndrome (TTS) after Johnson & Johnson's Janssen (J&J/Janssen) COVID-19 vaccination is rare.** TTS is a rare but serious adverse event that causes blood clots in large blood vessels and low platelets (blood cells that help form clots). As of March 31, 2022, more than 18.5 million doses of the J&J/Janssen COVID-19 vaccine have been given in the United States. CDC and FDA identified 60 confirmed reports of people who got the J&J/Janssen COVID-19 vaccine and later developed TTS.

  CDC has also identified nine deaths that have been caused by or were directly attributed to TTS following J&J/Janssen COVID-19 vaccination. Women ages 30-49 years, especially, should be aware of the increased risk of this rare adverse event. There are other COVID-19 vaccine options available for which this risk has not been seen.

  - To date, four confirmed cases of TTS following mRNA COVID-19 vaccination (3 after Moderna, 1 after Pfizer-BioNTech) have been reported to VAERS after more than 541 million doses of mRNA COVID-19 vaccines administered in the United States. Based on available data, there is not an increased risk for TTS after mRNA COVID-19 vaccination.

- **Guillain-Barré Syndrome (GBS) in people who have received the J&J/Janssen COVID-19 vaccine is rare.** GBS is a rare disorder where the body's immune system damages nerve cells, causing muscle weakness and sometimes paralysis. Most people fully recover from GBS, but some have permanent nerve damage. After more than 18.5 million J&J/Janssen COVID-19 vaccine doses administered, there have been around 312 preliminary reports of GBS identified in VAERS as of March 31, 2022. These cases have largely been reported about 2 weeks after vaccination and mostly in men, many in those ages 50 years and older.

  Based on the data, the rate of GBS within the first 21 days following J&J/Janssen COVID-19 vaccination was found to be 21 times higher than after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). After the first 42 days, the rate of GBS was 11 times higher following J&J/Janssen COVID-19 vaccination. Analysis found no increased risk of GBS after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). CDC and FDA will continue to monitor for and evaluate reports of GBS occurring after COVID-19 vaccination and will share more information as it becomes available.

- **Myocarditis and pericarditis after COVID-19 vaccination are rare.** Myocarditis is inflammation of the heart muscle, and pericarditis is inflammation of the outer lining of the heart. Most patients with myocarditis or pericarditis after COVID-19 vaccination responded well to medicine and rest and felt better quickly. As of March 31, 2022, VAERS has received 2,332 preliminary reports of myocarditis or pericarditis among people ages 30 years and younger who received COVID-19 vaccines.

  Most cases have been reported after receiving Pfizer-BioNTech or Moderna, (mRNA COVID-19 vaccines) particularly in male adolescents and young adults. Through

follow-up, including medical record reviews, CDC and FDA have verified 1,407 reports of myocarditis or pericarditis. Learn more about myocarditis and pericarditis, including clinical considerations, after mRNA COVID-19 vaccination.

- **Reports of death after COVID-19 vaccination are rare.** FDA requires healthcare providers to report any death after COVID-19 vaccination to VAERS, even if it's unclear whether the vaccine was the cause. **Reports of adverse events to VAERS following vaccination, including deaths, do not necessarily mean that a vaccine caused a health problem.** More than 562 million doses of COVID-19 vaccines were administered in the United States from December 14, 2020, through April 4, 2022. During this time, VAERS received 13,853 preliminary reports of death (0.0025%) among people who received a COVID-19 vaccine. CDC and FDA clinicians review reports of death to VAERS including death certificates, autopsy, and medical records.

A review of reports indicates a causal relationship between the J&J/Janssen COVID-19 vaccine and TTS. CDC scientists have conducted detailed reviews of TTS cases and made the information available to healthcare providers and the public:

- US Case Reports of Cerebral Venous Sinus Thrombosis With Thrombocytopenia After Ad26.COV2.S Vaccination, March 2 to April 21, 2021
- Case Series of Thrombosis with Thrombocytopenia Syndrome following COVID-19 vaccination—United States, December 2020–August 2021
- Updates on Thrombosis with Thrombocytopenia Syndrome (TTS) [1.3 MB, 39 Pages]

Continued monitoring has identified nine deaths causally associated with J&J/Janssen COVID-19 vaccination. CDC and FDA continue to review reports of death following COVID-19 vaccination and update information as it becomes available.

Related Pages

- Safety of COVID-19 Vaccines
- Vaccine Adverse Event Reporting System (VAERS): What Reports Mean and How VAERS Works
- COVID-19 Vaccine Safety Publications

Last Updated Apr. 4, 2022
Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

COVID-19

Selected Adverse Events Reported after COVID-19 Vaccination

Updated Apr. 12, 2022

Safety of COVID-19 Vaccines

Some people have no side effects. Many people have reported side effects that are generally mild to moderate and go away within a few days.

What You Need to Know

- COVID-19 vaccines are **safe and effective**.
- CDC recommends everyone ages 5 years and older get vaccinated as soon as possible to protect against COVID-19 and its potentially severe complications. CDC has updated its recommendation for COVID-19 vaccines with a preference for mRNA vaccines (Pfizer-BioNTech and Moderna).
- Millions of people in the United States have received COVID-19 vaccines under the most intense safety monitoring program in U.S. history.
- CDC, the U.S. Food and Drug Administration (FDA), and other federal agencies continue to monitor the safety of COVID-19 vaccines.
- Adverse events described on this page have been reported to the Vaccine Adverse Event Reporting System (VAERS) .
- VAERS accepts reports of any adverse event following vaccination.

Serious adverse events after COVID-19 vaccination are rare but may occur.

CDC is providing timely updates on the following serious adverse events of interest:

- **Anaphylaxis after COVID-19 vaccination is rare** and has occurred in approximately 5 people per one million vaccinated in the United States. Anaphylaxis,

a severe type of allergic reaction, can occur after any kind of vaccination. If it happens, healthcare providers can effectively and immediately treat the reaction. Learn more about COVID-19 vaccines and allergic reactions, including anaphylaxis.

- **Thrombosis with thrombocytopenia syndrome (TTS) after Johnson & Johnson's Janssen (J&J/Janssen) COVID-19 vaccination is rare.** TTS is a rare but serious adverse event that causes blood clots in large blood vessels and low platelets (blood cells that help form clots). As of April 7, 2022, more than 18.6 million doses of the J&J/Janssen COVID-19 vaccine have been given in the United States. CDC and FDA identified 60 confirmed reports of people who got the J&J/Janssen COVID-19 vaccine and later developed TTS.

  CDC has also identified nine deaths that have been caused by or were directly attributed to TTS following J&J/Janssen COVID-19 vaccination. Women ages 30-49 years, especially, should be aware of the increased risk of this rare adverse event. There are other COVID-19 vaccine options available for which this risk has not been seen.

  - To date, four confirmed cases of TTS following mRNA COVID-19 vaccination (3 after Moderna, 1 after Pfizer-BioNTech) have been reported to VAERS after more than 544 million doses of mRNA COVID-19 vaccines administered in the United States. Based on available data, there is not an increased risk for TTS after mRNA COVID-19 vaccination.

- **Guillain-Barré Syndrome (GBS) in people who have received the J&J/Janssen COVID-19 vaccine is rare.** GBS is a rare disorder where the body's immune system damages nerve cells, causing muscle weakness and sometimes paralysis. Most people fully recover from GBS, but some have permanent nerve damage. After more than 18.6 million J&J/Janssen COVID-19 vaccine doses administered, there have been around 313 preliminary reports of GBS identified in VAERS as of April 7, 2022. These cases have largely been reported about 2 weeks after vaccination and mostly in men, many in those ages 50 years and older.

  Based on the data, the rate of GBS within the first 21 days following J&J/Janssen COVID-19 vaccination was found to be 21 times higher than after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). After the first 42 days, the rate of GBS was 11 times higher following J&J/Janssen COVID-19 vaccination. Analysis found no increased risk of GBS after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). CDC and FDA will continue to monitor for and evaluate reports of GBS occurring after COVID-19 vaccination and will share more information as it becomes available.

- **Myocarditis and pericarditis after COVID-19 vaccination are rare.** Myocarditis is inflammation of the heart muscle, and pericarditis is inflammation of the outer lining of the heart. Most patients with myocarditis or pericarditis after COVID-19 vaccination responded well to medicine and rest and felt better quickly. As of April 7, 2022, VAERS has received 2,341 preliminary reports of myocarditis or pericarditis among people ages 30 years and younger who received COVID-19 vaccines.

  Most cases have been reported after receiving Pfizer-BioNTech or Moderna, (mRNA COVID-19 vaccines) particularly in male adolescents and young adults. Through

follow-up, including medical record reviews, CDC and FDA have verified 1,433 reports of myocarditis or pericarditis. Learn more about myocarditis and pericarditis, including clinical considerations, after mRNA COVID-19 vaccination.

- **Reports of death after COVID-19 vaccination are rare.** FDA requires healthcare providers to report any death after COVID-19 vaccination to VAERS, even if it's unclear whether the vaccine was the cause. **Reports of adverse events to VAERS following vaccination, including deaths, do not necessarily mean that a vaccine caused a health problem.** More than 565 million doses of COVID-19 vaccines were administered in the United States from December 14, 2020, through April 11, 2022. During this time, VAERS received 14,068 preliminary reports of death (0.0025%) among people who received a COVID-19 vaccine. CDC and FDA clinicians review reports of death to VAERS including death certificates, autopsy, and medical records.

  A review of reports indicates a causal relationship between the J&J/Janssen COVID-19 vaccine and TTS. CDC scientists have conducted detailed reviews of TTS cases and made the information available to healthcare providers and the public:

  - US Case Reports of Cerebral Venous Sinus Thrombosis With Thrombocytopenia After Ad26.COV2.S Vaccination, March 2 to April 21, 2021
  - Case Series of Thrombosis with Thrombocytopenia Syndrome following COVID-19 vaccination—United States, December 2020–August 2021
  - Updates on Thrombosis with Thrombocytopenia Syndrome (TTS) [1.3 MB, 39 Pages]

  Continued monitoring has identified nine deaths causally associated with J&J/Janssen COVID-19 vaccination. CDC and FDA continue to review reports of death following COVID-19 vaccination and update information as it becomes available.

Related Pages

- Safety of COVID-19 Vaccines
- Vaccine Adverse Event Reporting System (VAERS): What Reports Mean and How VAERS Works
- COVID-19 Vaccine Safety Publications

Last Updated Apr. 12, 2022
Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

COVID-19

Selected Adverse Events Reported after COVID-19 Vaccination

Updated Apr. 18, 2022

Safety of COVID-19 Vaccines

Some people have no side effects. Many people have reported side effects, such as headache, fatigue, and soreness at the injection site, that are generally mild to moderate and go away within a few days.

What You Need to Know

- COVID-19 vaccines are **safe and effective and severe reactions after vaccination are rare.**
- CDC recommends everyone ages 5 years and older get vaccinated as soon as possible to protect against COVID-19 and its potentially severe complications.
- Although mRNA vaccines (Pfizer-BioNTech or Moderna COVID-19 vaccines) are preferred, Johnson & Johnson's Janssen COVID-19 vaccine may be considered in some situations.
- Millions of people in the United States have received COVID-19 vaccines under the most intense safety monitoring program in U.S. history.
- CDC, the U.S. Food and Drug Administration (FDA), and other federal agencies continue to monitor the safety of COVID-19 vaccines.
- Adverse events described on this page have been reported to the Vaccine Adverse Event Reporting System (VAERS) .
- VAERS accepts reports of any adverse event following vaccination.

The benefits of COVID-19 vaccination continue to outweigh any potential risks.

CDC is providing timely updates on the following adverse events of interest:

- **Anaphylaxis after COVID-19 vaccination is rare** and has occurred at a rate of approximately 5 cases per one million vaccine doses administered. Anaphylaxis, a severe type of allergic reaction, can occur after any kind of vaccination. If it happens, healthcare providers can effectively and immediately treat the reaction. Learn more about COVID-19 vaccines and allergic reactions, including anaphylaxis.

  CDC scientists have conducted detailed reviews of cases of anaphylaxis and made the information available to healthcare providers and the public:

  - Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine
  - Reports of Anaphylaxis After Receipt of mRNA COVID-19 Vaccines in the US—December 14, 2020-January 18, 2021
  - Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Moderna COVID-19 Vaccine— United States, December 21, 2020-January 10, 2021
  - Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine — United States, December 14-23, 2020

- **Thrombosis with thrombocytopenia syndrome (TTS) after J&J/Janssen COVID-19 vaccination is rare** and has occurred in approximately 4 cases per one million doses administered. TTS is a rare but serious adverse event that causes blood clots in large blood vessels and low platelets (blood cells that help form clots).

  A review of reports indicates a causal relationship between the J&J/Janssen COVID-19 vaccine and TTS. CDC scientists have conducted detailed reviews of TTS cases and made the information available to healthcare providers and the public:

  - US Case Reports of Cerebral Venous Sinus Thrombosis With Thrombocytopenia After Ad26.COV2.S Vaccination, March 2 to April 21, 2021
  - Case Series of Thrombosis with Thrombocytopenia Syndrome following COVID-19 vaccination—United States, December 2020–August 2021
  - Updates on Thrombosis with Thrombocytopenia Syndrome (TTS) [1.3 MB, 39 Pages]

- **Guillain-Barré Syndrome (GBS) in people who have received the J&J/Janssen COVID-19 vaccine is rare.** GBS is a rare disorder where the body's immune system damages nerve cells, causing muscle weakness and sometimes paralysis. GBS has largely been reported in men ages 50 years and older.

  Based on a recent analysis of data from the Vaccine Safety Datalink, the rate of GBS within the first 21 days following J&J/Janssen COVID-19 vaccination was found to be 21 times higher than after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). After the first 42 days, the rate of GBS was 11 times higher following J&J/Janssen COVID-19 vaccination. The analysis found no increased risk of GBS after Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines). CDC and FDA will continue to monitor for and evaluate reports of GBS occurring after COVID-19 vaccination and will share more information as it becomes available.

- **Myocarditis and pericarditis after COVID-19 vaccination are rare.** Myocarditis is inflammation of the heart muscle, and pericarditis is inflammation of the outer

lining of the heart. Most patients with myocarditis or pericarditis after COVID-19 vaccination responded well to medicine and rest and felt better quickly. Most cases have been reported after receiving Pfizer-BioNTech or Moderna (mRNA COVID-19 vaccines), particularly in male adolescents and young adults.

A review of vaccine safety data in VAERS from December 2020–August 2021 found a small but increased risk of myocarditis after mRNA COVID-19 vaccines. Over 350 million mRNA vaccines were given during the study period and CDC scientists found that rates of myocarditis were highest following the second dose of an mRNA vaccine among males in the following age groups:

- 12–15 years (70.7 cases per one million doses of Pfizer-BioNTech)
- 16–17 years (105.9 cases per one million doses of Pfizer-BioNTech)
- 18–24 years (52.4 cases and 56.3 cases per million doses of Pfizer-BioNTech and Moderna, respectively)

Multiple studies and reviews of data from vaccine safety monitoring systems continue to show that vaccines are safe. As a result, the agency will refocus enhanced surveillance and safety monitoring efforts toward children and adolescents.

As of April 14, 2022, there have been 964 reports in VAERS among people younger than age 18 years under review for potential cases of myocarditis and pericarditis. Of those, 255 remain under review. Through confirmation of symptoms and diagnostics by provider interview or review of medical records, 653 reports have been verified. See the following for a breakdown of reports by age group.

5-11 years: 16 verified reports of myocarditis after 18,078,878 doses administered

12-15 years: 345 verified reports of myocarditis after 22,985,751 doses administered

16-17 years: 292 verified reports of myocarditis after 12,525,509 doses administered

As the COVID-19 vaccines are authorized for younger children, CDC and FDA will continue to monitor for and evaluate reports of myocarditis and pericarditis after COVID-19 vaccination and will share more information as it becomes available. Learn more about myocarditis and pericarditis, including clinical considerations, after mRNA COVID-19 vaccination.

- **Reports of death after COVID-19 vaccination are rare.** FDA requires healthcare providers to report any death after COVID-19 vaccination to VAERS, even if it's unclear whether the vaccine was the cause. **Reports of adverse events to VAERS following vaccination, including deaths, do not necessarily mean that a vaccine caused a health problem.** More than 569 million doses of COVID-19 vaccines were administered in the United States from December 14, 2020, through April 18, 2022. During this time, VAERS received 14,180 preliminary reports of death (0.0025%) among people who received a COVID-19 vaccine. CDC and FDA clinicians review reports of death to VAERS including death certificates, autopsy, and medical records.

Continued monitoring has identified nine deaths causally associated with J&J/Janssen COVID-19 vaccination. CDC and FDA continue to review reports of death following COVID-19 vaccination and update information as it becomes available.

Related Pages

- Safety of COVID-19 Vaccines
- Vaccine Adverse Event Reporting System (VAERS): What Reports Mean and How VAERS Works
- COVID-19 Vaccine Safety Publications

Last Updated Apr. 18, 2022
Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

COVID-19

Selected Adverse Events Reported after COVID-19 Vaccination

Updated Apr. 25, 2022

Safety of COVID-19 Vaccines

Some people have no side effects. Many people have reported side effects, such as headache, fatigue, and soreness at the injection site, that are generally mild to moderate and go away within a few days.

What You Need to Know

- COVID-19 vaccines are **safe and effective and severe reactions after vaccination are rare.**
- CDC recommends everyone ages 5 years and older get vaccinated as soon as possible to protect against COVID-19 and its potentially severe complications.
- Although mRNA vaccines (Pfizer-BioNTech or Moderna COVID-19 vaccines) are preferred, Johnson & Johnson's Janssen COVID-19 vaccine may be considered in some situations.
- Millions of people in the United States have received COVID-19 vaccines under the most intense safety monitoring program in U.S. history.
- CDC, the U.S. Food and Drug Administration (FDA), and other federal agencies continue to monitor the safety of COVID-19 vaccines.
- Adverse events described on this page have been reported to the Vaccine Adverse Event Reporting System (VAERS) .
- VAERS accepts reports of any adverse event following vaccination.

The benefits of COVID-19 vaccination continue to outweigh any potential risks.

CDC is providing timely updates on the following adverse events of interest:

- **Anaphylaxis after COVID-19 vaccination is rare** and has occurred at a rate of approximately 5 cases per one million vaccine doses administered. Anaphylaxis, a severe type of allergic reaction, can occur after any kind of vaccination. If it happens, healthcare providers can effectively and immediately treat the reaction. Learn more about COVID-19 vaccines and allergic reactions, including anaphylaxis.

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Multiple studies and reviews of data from vaccine safety monitoring systems continue to show that vaccines are safe. As a result, the agency will refocus enhanced surveillance and safety monitoring efforts toward children and adolescents.

As of April 21, 2022, there have been 962 reports in VAERS among people younger than age 18 years under review for potential cases of myocarditis and pericarditis. Of those, 252 remain under review. Through confirmation of symptoms and diagnostics by provider interview or review of medical records, 657 reports have been verified. See the following for a breakdown of reports by age group.

5-11 years: 18 verified reports of myocarditis after 18,182,496 doses administered

12-15 years: 345 verified reports of myocarditis after 23,057,480 doses administered

16-17 years: 294 verified reports of myocarditis after 12,565,674 doses administered

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