Natural Solutions for the FLU

Dr. Bryan Ardis D.C.

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Flu (Influenza)

The flu is a common respiratory illness you get from the influenza virus. Symptoms often include fever, head and body aches, coughing and a stuffy or runny nose. You're at risk for serious complications if you have an underlying health condition or are pregnant. Getting vaccinated every year is the best way to avoid getting sick with the flu. ❓

https://my.clevelandclinic.org/health/diseases/4335-influenza-flu

Covid-19 vs. Cold vs. Flu Symptoms

SYMPTOMS	COVID-19†	COLD	FLU
 Sore throat	Sometimes	Common	Common
 Cough	Common	Common	Common
 Sneezing	–	Common	Sometimes
 Fever	Common	–	Common
 Body aches	Sometimes	Sometimes (mild)	Common
 Tiredness	Sometimes	Sometimes (mild)	Common
 Headache	Sometimes	–	Common
 Runny/stuffy nose	Sometimes	Common	Sometimes
 Shortness of breath	Sometimes	–	Sometimes
 Loss of taste and/or smell	Sometimes	–	–

https://my.clevelandclinic.org/health/diseases/4335-influenza-flu

When is flu season?

Flu season — when cases of the flu go up dramatically — in the Northern Hemisphere (which includes the U.S.) is October through May. The highest number of cases (peak) usually happen between December and February.

How common is the flu?

The flu is one of the most common infectious diseases. Every flu season, about 20 to 40 million people in the U.S. catch the flu.

https://my.clevelandclinic.org/health/diseases/4335-influenza-flu

Who is at higher risk for complications from the flu?

Certain health conditions can put you at higher risk for severe illness from the flu. This includes life-threatening complications that require hospitalization. You're at higher risk for serious illness if you:

- Have asthma, COPD or another chronic lung disease.
- Have a history of kidney, liver, neurological, heart or blood vessels disease, including stroke.
- Have a condition that causes issues with muscle function or makes it difficult to cough, swallow or clear fluids from your airways.
- Have diabetes.
- Have a weakened immune system (from HIV/AIDS, cancer or immunosuppressive medications).
- Have a blood disorder, like sickle cell disease.
- Have a BMI greater than 30 (have obesity).
- Are under 5 years old or over 65 years old.
- Are pregnant.
- Are under 19 years old and take aspirin regularly.
- Live in a long-term care facility.

https://my.clevelandclinic.org/health/diseases/4335-influenza-flu

How many people die from the flu each year?

In a typical flu season in the U.S., it's estimated that between 20,000 and 50,000 people die from the flu. Another 300,000 to 500,000 require hospitalization for serious illness.

https://my.clevelandclinic.org/health/diseases/4335-influenza-flu

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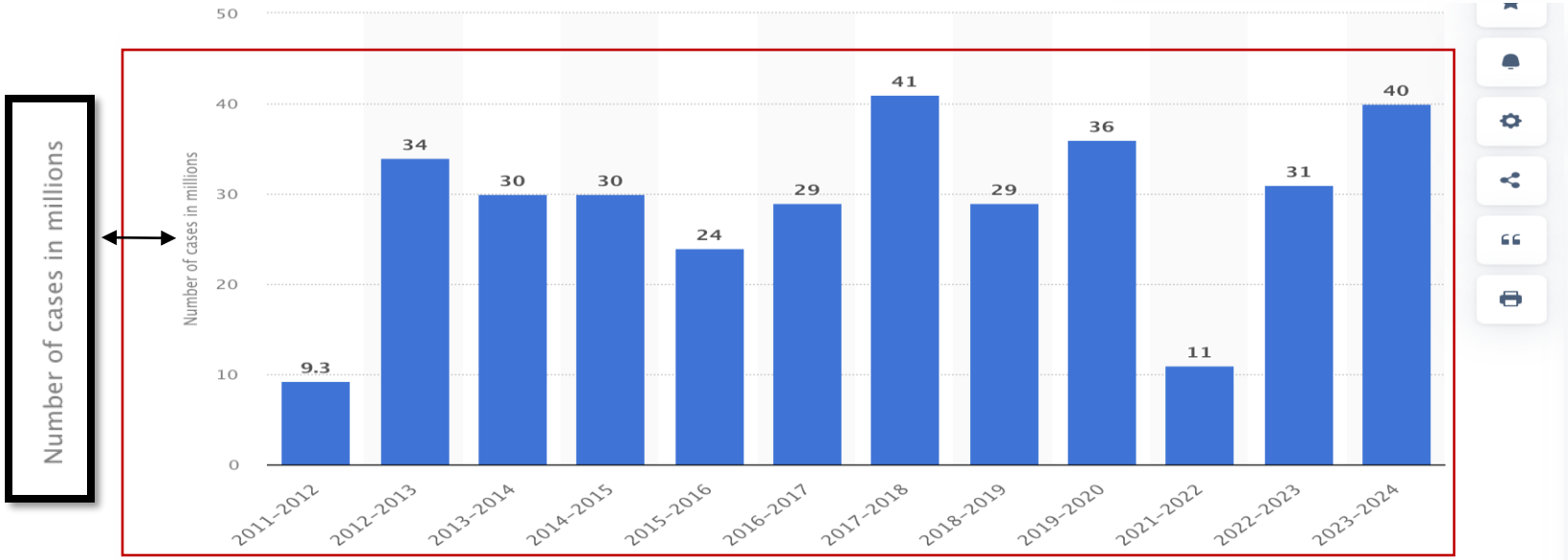
Estimated number of influenza cases in the United States from 2011 to 2024

(in millions)



Additional Information

Show source

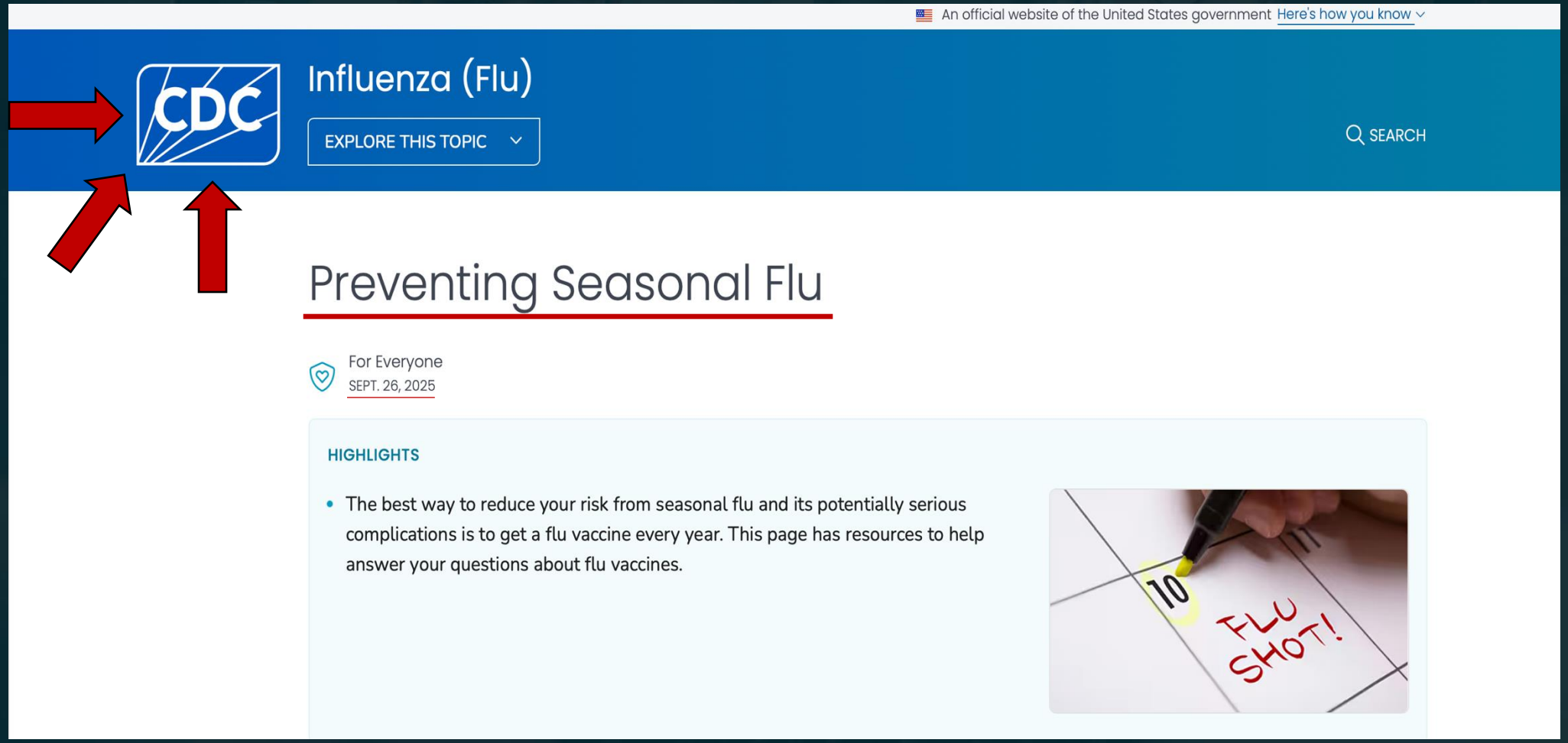
https://www.statista.com/statistics/861113/estimated-number-of-flu-cases-us/?srsltid=AfmBOoprZ_TGICE2k-gas3f1ng2YJmozvu_DjS4dblb4k42J8tgKhOym

What medications treat the flu?

Antiviral drugs for influenza include:

- **Oseltamivir phosphate (Tamiflu®).** You take oseltamivir by mouth as a pill or a liquid. You usually take it for several days.
- **Zanamivir (Relenza®).** You breathe zanamivir in through your mouth with an inhaler. You usually have to take it for several days. Zanamivir isn't recommended for people with breathing issues, like asthma or COPD.
- **Peramivir (Rapivap®).** Your provider gives you peramivir directly into your veins using an IV. You usually only need one dose of peramivir.
- **Baloxavir marboxil (Xofluza®).** You take baloxavir marboxil by mouth as a pill or a liquid. You only take one dose. Baloxavir isn't recommended if you're pregnant, breastfeeding, hospitalized or have certain medical conditions.

https://my.clevelandclinic.org/health/diseases/4335-influenza-flu



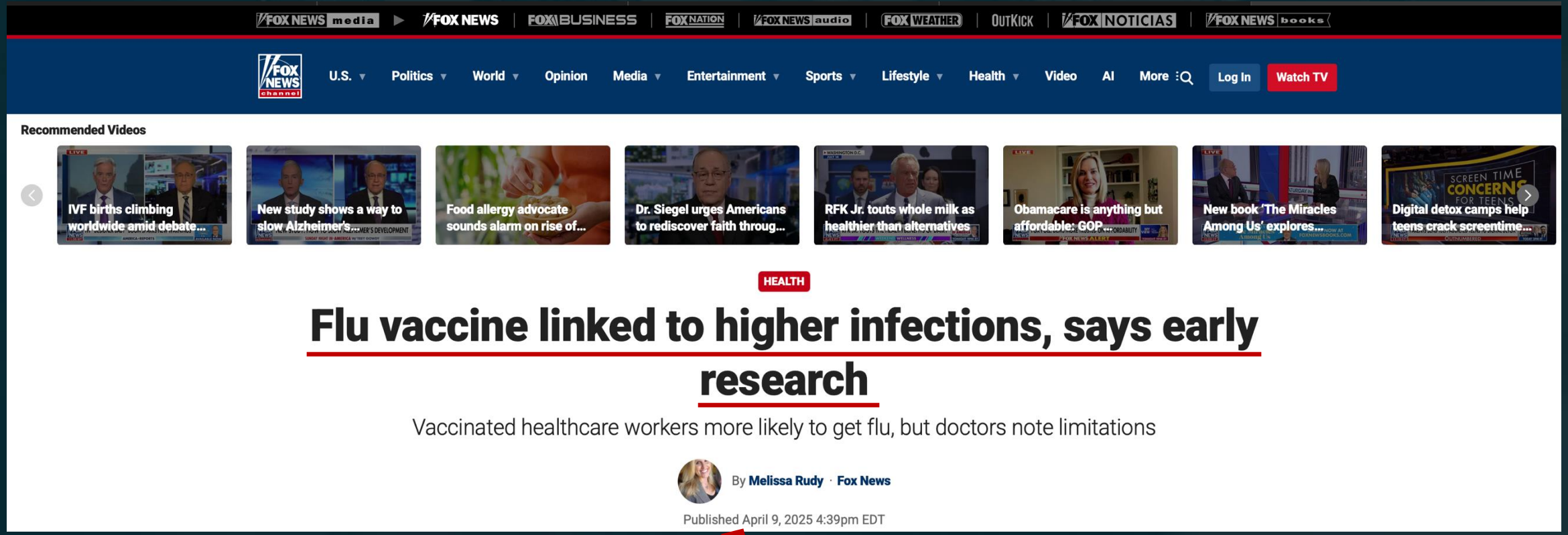
https://www.cdc.gov/flu/prevention/index.html

Prevention steps and strategies

Take time to get a flu vaccine.

- Everyone 6 months and older should get a flu vaccine every season, especially people at higher risk.
- CDC recommends a yearly flu vaccine as the first and most important action in reducing your risk of flu and its potentially serious outcomes.
- For 2025-2026 flu season, CDC recommends seasonal flu vaccination for children, pregnant women, and adults with only single-dose formulations of flu vaccine that are free of thimerosal as a preservative.
- Flu vaccines help to reduce the burden of flu illnesses, hospitalizations and deaths on the health care system each year. (Read more about flu vaccine benefits.)
- Flu vaccination also has been shown to reduce the severity of illness in people who get vaccinated but still get sick.
- All flu vaccines are designed to protect against three influenza viruses (Visit Vaccine Virus Selection for this season's vaccine composition.)
- Everyone 6 months and older should get an annual flu vaccine, ideally by the end of October but people should continue to get vaccinated as long as flu viruses pose a threat to their community.

https://www.cdc.gov/flu/prevention/index.html



https://www.foxnews.com/health/flu-vaccine-linked-higher-infections-says-early-research

The flu vaccine is recommended annually for all Americans 6 months and older, per the Centers for Disease Control and Prevention — but a new study from Cleveland Clinic suggests that it might not have the protective effects people expect.

The preprint study, which was published on MedRxiv.org this week, looked at infection data for the 2024-2025 flu season.

Researchers found that among 53,402 Cleveland Clinic employees in northern Ohio, getting the influenza vaccine was associated with a 27% increase in flu infections.

https://www.foxnews.com/health/flu-vaccine-linked-higher-infections-says-early-research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Home > Tamiflu

Tamiflu

Generic name: oseltamivir [*os-el-TAM-ih-veer*]

Drug class: Neuraminidase inhibitors

Medically reviewed by Sanjai Sinha, MD. Last updated on March 21, 2024.

Uses | Warnings | Before taking | Dosage | Side effects | Interactions | FAQ

What is Tamiflu?

Tamiflu is an antiviral medication that blocks the actions of influenza virus types A and B in your body.

Tamiflu is used to treat flu symptoms caused by influenza virus in people have had symptoms for less than 2 days. This medicine may also be given to prevent influenza in people who may be exposed but do not yet have symptoms. Tamiflu will not treat the common cold.

https://www.drugs.com/tamiflu.html

Tamiflu Side Effects

Generic name: *oseltamivir*

Medically reviewed by Drugs.com. Last updated on Sep 24, 2025.

Nervous system

- **Very common** (10% or more): Headache (up to 17%)
- **Common** (1% to 10%): Dizziness, vertigo
- **Frequency not reported**: Drowsiness
- **Postmarketing reports**: Seizure/convulsion[Ref]

Gastrointestinal

- **Very common** (10% or more): Nausea
- **Common** (1% to 10%): Vomiting, diarrhea, abdominal pain, upper abdominal pain, dyspepsia
- **Frequency not reported**: Pseudomembranous colitis
- **Postmarketing reports**: Gastrointestinal bleeding, hemorrhagic colitis[Ref]

https://www.drugs.com/tamiflu.html

Respiratory

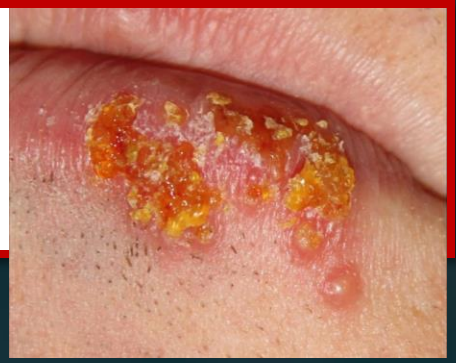
- **Common** (1% to 10%): Nasal congestion, cough, sore throat, bronchitis, nasopharyngitis, upper respiratory tract infections, influenza, rhinorrhea, sinusitis
- **Frequency not reported**: Pneumonia, peritonsillar abscess, congestion, rhinitis, dry sore throat, epistaxis, asthma, aggravated asthma[Ref]

Psychiatric

- **Common** (1% to 10%): Insomnia
- **Frequency not reported**: Mania
- **Postmarketing reports**: Abnormal behavior, delirium, altered level of consciousness, confusion, delusions, hallucinations, agitation, anxiety, nightmares, self-injury[Ref]

Dermatologic

- **Common** (1% to 10%): Herpes simplex
- **Uncommon** (0.1% to 1%): Dermatitis (including allergic and atopic dermatitis)



https://www.drugs.com/tamiflu.html

Other

- **Common** (1% to 10%): Fatigue, pain, pyrexia, influenza-like illness, pain in limb, otitis media, earache
- **Uncommon** (0.1% to 1%): Tympanic membrane disorder
- **Frequency not reported**: Humerus fracture, malaise, sepsis, facial edema, ear disorder, accidental injury
- **Postmarketing reports**: Hypothermia[Ref]

Ocular

- **Common** (1% to 10%): Conjunctivitis (including red eyes, eye discharge, eye pain)
- **Postmarketing reports**: Visual disturbances[Ref]

https://www.drugs.com/tamiflu.html

Home > Relenza

Relenza

Generic name: zanamivir [*zan-AM-i-vir*]
Drug classes: Inhaled anti-infectives, Neuraminidase inhibitors

Medically reviewed by Drugs.com. Last updated on Oct 14, 2024.

Uses | Warnings | Before taking | Dosage | Side effects

What is Relenza?

Relenza is an antiviral medicine that blocks the actions of viruses in your body.

Relenza is used to treat flu symptoms caused by influenza virus in people who have had symptoms for less than 2 days.

Relenza may also be given to prevent influenza in people who may be exposed but do not yet have symptoms. Zanamivir will not treat the common cold.

https://www.drugs.com/relenza.html

Relenza Side Effects

Generic name: *zanamivir*

Medically reviewed by Drugs.com. Last updated on Jan 30, 2025.

Respiratory

- **Very common** (10% or more): Throat/tonsil discomfort/pain (up to 19%), cough (up to 17%), viral respiratory infections (up to 13%), nasal signs/symptoms (up to 12%)
- **Common** (1% to 10%): Sinusitis, bronchitis, ear/nose/throat infections, nasal inflammation, decline in forced expiratory volume in 1 second (FEV1)
- **Frequency not reported**: Bronchospasm-like events, congestion, rhinitis, dry throat, ear/nose/throat hemorrhage, asthma, exacerbation of asthma, respiratory arrest, lung tightness, decline in lung function, throat tightness/constriction

Musculoskeletal

- **Common** (1% to 10%): Muscle pain, musculoskeletal pain, arthralgia/articular rheumatism
- **Frequency not reported**: Myalgia, arthralgia, elevated creatine phosphokinase[Ref]

https://www.drugs.com/relenza.html

Nervous system

- **Very common** (10% or more): Headaches (up to 24%)
- **Common** (1% to 10%): Dizziness
- **Postmarketing reports**: Seizures, syncope, vasovagal-like episodes shortly after inhalation

Other

- **Common** (1% to 10%): Malaise/fatigue, temperature regulation disturbances (fever/chills)
- **Frequency not reported**: Malaise, fatigue, fever
- **Postmarketing reports**: Facial edema

Dermatologic

- **Frequency not reported**: Urticaria
- **Postmarketing reports**: Rash, serious cutaneous reactions (e.g., erythema multiforme, Stevens-Johnson syndrome, toxic epidermal necrolysis), urticaria

https://www.drugs.com/relenza.html

Hypersensitivity

- **Postmarketing reports**: Allergic/allergic-like reactions (including oropharyngeal edema, serious skin rashes, anaphylaxis, anaphylactic/anaphylactoid reactions, facial edema)

Psychiatric

- **Postmarketing reports**: Delirium, altered level of consciousness, confusion, abnormal behavior, delusions, hallucinations, agitation, anxiety, nightmares

Gastrointestinal

- **Common** (1% to 10%): Diarrhea, nausea, vomiting, nausea/vomiting
- **Frequency not reported**: Abdominal pain

Metabolic

- **Common** (1% to 10%): Feeding problems (decreased/increased appetite, anorexia)
- **Frequency not reported**: Hyperkalemia[Ref]

Renal

- **Frequency not reported**: Acute renal failure, increased serum creatinine[Ref]

https://www.drugs.com/relenza.html

Home > Influenza virus vaccine, inactivated

Influenza virus vaccine (injection)

Generic name: influenza virus vaccine (injection) [*IN-floo-EN-za-VYE-rus-VAK-seen*]

Brand names: Afluria PF Pediatric Quadrivalent 2021-2022 injection, Afluria PF Quadrivalent 2021-2022 injection, Afluria PF Quadrivalent 2022-2023 injection, Afluria Quadrivalent 2021-2022 injection, Afluria Quadrivalent 2022-2023 injection, ... show all 265 brands

Dosage forms: intramuscular solution (recombinant hemagglutinin quadrivalent; recombinant hemagglutinin trivalent preservative-free), ... show all 2 dosage forms

Drug class: Viral vaccines

Medically reviewed

... show all 265 brands

Uses | Side effects | Warnings | Before taking | Dosage | Interactions | FAQ

https://www.drugs.com/mtm/influenza-virus-vaccine-injection.html

What is influenza virus vaccine?

Influenza virus ("the flu") is a contagious disease caused by a virus that can spread from one person to another through the air or on surfaces. Flu symptoms include fever, chills, tiredness, aches, sore throat, cough, vomiting, and diarrhea. The flu can also cause sinus infections, ear infections, bronchitis, or serious complications such as pneumonia.

Influenza virus vaccine is for use in adults and children to prevent infection caused by influenza virus. This vaccine helps your body develop immunity to the disease, but will not treat an active infection you already have.

The injectable influenza virus vaccine (flu shot) is made from "killed viruses." **This medication guide addresses only the injectable form of this vaccine.**

Like any vaccine, influenza virus vaccine may not provide protection from disease in every person.

https://www.drugs.com/mtm/influenza-virus-vaccine-injection.html

Influenza Virus Vaccine, Inactivated Side Effects

Medically reviewed by Drugs.com. Last updated on Feb 14, 2025.

Cardiovascular

- **Common** (1% to 10%): Chest tightness
- **Rare** (0.01% to 0.1%): Flushing/vasodilation, hot flush
- **Frequency not reported**: Myocarditis
- **Postmarketing reports**: Chest pain, extensive swelling of injected limb, Henoch-Schonlein purpura, pallor, tachycardia, vasculitis (potentially associated with transient renal involvement)

Dermatologic

- **Common** (1% to 10%): Facial swelling, rash, sweating
- **Rare** (0.01% to 0.1%): Pruritus, night sweats, urticaria, hyperhidrosis
- **Frequency not reported**: Cellulitis-like reactions, erythema multiforme
- **Postmarketing reports**: Angioedema, cellulitis, erythema, generalized rash, generalized skin reactions, localized rash, non-specific rash (local/generalized), Stevens-Johnson syndrome

https://www.drugs.com/mtm/influenza-virus-vaccine-injection.html

Gastrointestinal

- **Very common** (10% or more): Diarrhea (up to 24.2%), vomiting (up to 14.8%), nausea (up to 11%)
- **Common** (1% to 10%): Oropharyngeal pain, teething
- **Uncommon** (0.1% to 1%): Upper abdominal pain
- **Frequency not reported**: Gastroenteritis
- **Postmarketing reports**: Abdominal pain, dysphagia, swelling of the mouth, throat, and/or tongue

Hypersensitivity

- **Uncommon** (0.1% to 1%): Hypersensitivity
- **Rare** (0.01% to 0.1%): Allergic reactions
- **Postmarketing reports**: Anaphylactic shock, anaphylaxis, immediate hypersensitivity reactions, other allergic reactions, other hypersensitivity reactions, serum sickness, shock

Immunologic

- **Frequency not reported**: Influenza B infection (vaccine failure)

Metabolic

- **Very common** (10% or more): Loss of appetite (up to 32.3%), eating habit changes (up to 21%)

https://www.drugs.com/mtm/influenza-virus-vaccine-injection.html

Local

- **Very common** (10% or more): Injection site tenderness (up to 89.4%), injection site pain (up to 64.4%), injection site swelling (up to 64.8%), injection site redness/erythema (up to 60.1%), injection site itching (up to 28%), injection site induration (up to 19%), injection site bruising/hematoma (up to 17.6%), injection site ecchymosis (up to 15.2%), injection site lump (up to 11%)
- **Uncommon** (0.1% to 1%): Injection site warmth
- **Rare** (0.01% to 0.1%): Injection site discomfort
- **Postmarketing reports**: Injection site cellulitis-like reaction, injection site inflammation, injection site rash, injection site reaction, injection site sterile abscess, large injection site swelling

Musculoskeletal

- **Very common** (10% or more): Myalgia/musculoskeletal pain (up to 36.4%), muscle aches (up to 29%), arthralgia (up to 13%)
- **Common** (1% to 10%): Chills, shivering
- **Uncommon** (0.1% to 1%): Muscular/muscle weakness
- **Frequency not reported**: Myositis
- **Postmarketing reports**: Abnormal gait, arthritis, extremity pain, decreased injected limb mobility

https://www.drugs.com/mtm/influenza-virus-vaccine-injection.html

Respiratory

- **Very common** (10% or more): Rhinorrhea (up to 11.2%), cough (up to 10.4%)
- **Common** (1% to 10%): Croup infections/croup, nasal congestion, nasopharyngitis, sore throat, upper respiratory tract infection or congestion, pharyngolaryngeal pain, oropharyngeal pain
- **Frequency not reported**: Bronchitis, bronchiolitis, pneumonia, pulmonary congestion, shortness of breath
- **Postmarketing reports**: Asthma, bronchospasm, dyspnea, dysphonia, laryngitis, rhinitis, throat tightness, tonsillitis, wheezing

Ocular

- **Common** (1% to 10%): Reddened eyes/eye redness
- **Rare** (0.01% to 0.1%): Ocular hyperemia
- **Postmarketing reports**: Conjunctivitis, eye irritation, eye pain, eye swelling, eyelid swelling, optic neuritis/neuropathy, photophobia

Psychiatric

- **Very common** (10% or more): Irritability (up to 54%), abnormal crying (up to 41.2%)
- **Uncommon** (0.1% to 1%): Moaning, restlessness
- **Postmarketing reports**: Insomnia

https://www.drugs.com/mtm/influenza-virus-vaccine-injection.html

Nervous system

- **Very common** (10% or more): Drowsiness (up to 37.7%), sleepiness (up to 35.5%), headache (up to 30.3%)
- **Uncommon** (0.1% to 1%): Lethargy, vertigo
- **Rare** (0.01% to 0.1%): Dizziness, paresthesia, somnolence
- **Frequency not reported**: Febrile seizures
- **Postmarketing reports**: Brachial neuritis, convulsions/seizures, cranial nerve paralysis, encephalitis, encephalomyelitis, encephalopathy, facial nerve paralysis/facial palsy/Bell's palsy, febrile convulsions, Guillain-Barre syndrome (GBS), hypoesthesia, hypokinesia, limb paralysis, myelitis, neuralgia, neuritis, neuropathy, presyncope, syncope (shortly after vaccination), transverse myelitis, tremor

Other

- **Very common** (10% or more): Pain (up to 59%), malaise (up to 38.1%), fatigue (up to 22%)
- **Common** (1% to 10%): Ear infection/otitis media, influenza-like illness, fever/pyrexia
- **Rare** (0.01% to 0.1%): Asthenia
- **Frequency not reported**: Death 
- **Postmarketing reports**: Body aches, feeling hot

https://www.drugs.com/mtm/influenza-virus-vaccine-injection.html

What Dr. Ardis Recommends to Help Deal with the FLU

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Review Article | Open Access

Nigella sativa (Black Seed) as a Natural Remedy against Viruses

Rasha Saleh Basurra[1,2], Seok Mui Wang[3,4] and Mohammed Abdelfatah Alhoot[5]

[1]Post Graduate Centre (PGC), Management & Science University (MSU), Shah Alam, Selangor, Malaysia.

[2]Department of Paraclinic, Faculty of Medicine & Health Science, University of Aden, Aden, Yemen.

[3]Department of Medical Microbiology & Parasitology, Faculty of Medicine, Universiti Teknologi MARA, Selangor, Malaysia.

[4]Institute of Pathology, Laboratory and Forensic Medicine (I-PPerForM), Universiti Teknologi MARA, Selangor, Malaysia.

[5]International Medical School (IMS), Management & Science University (MSU), Shah Alam, Selangor, Malaysia.

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https://microbiologyjournal.org/nigella-sativa-black-seed-as-a-natural-remedy-against-viruses/

Nigella sativa against Influenza virus

Influenza viruses belong to the *Orthomyxoviridae* family; this family can be sub-grouped into A, B, and C. They are implicated in most cases of respiratory tract infections that manifest in fever, headache, sneezing, muscle pains, sore throat, and joint pains; more severe conditions, such as pneumonia, are also associated with influenza virus infection (Blumel et al., 2009; Eccles, 2005). Influenza virus infection has been considered the most devastating epidemic that caused the highest mortality in humans. In 1918, the influenza A virus pandemic (Spanish flu) caused the death of approximately 40 to 50 million people (Trilla, Trilla, & Daer, 2008). Avian influenza A virus (AIVs), called bird flu, is classified into subtypes based on different combinations of various viral surface proteins (such as hemagglutinin (HA) and neuraminidase (NA)). Several studies tested the effect of *Nigella sativa* on subtypes H9N2 and H5N2 against AIVs subtypes and found active inhibition of virus replication, enhanced immune response, and suppression of viral pathogenicity in poultry (Dorra et al., 2019; Mady, Arafa, Hussein, Aly, & Madbouly, 2013; S. Umar et al., 2016; Sajid Umar, Munir, et al., 2016; Sajid Umar et al., 2015; Sajid Umar, Rehman,

https://microbiologyjournal.org/nigella-sativa-black-seed-as-a-natural-remedy-against-viruses/

et al., 2016). The study by (Sajid Umar et al., 2015) suggested that clinical signs in H9N2 infected birds showed improvement upon dietary supplementation with either *Nigella sativa seeds* and TQ, or their combination. The study also reported a decline in clinical symptoms upon supplementation with 3% *Nigella sativa* seed; the antibody titre was also increased against H9N2 AIV, thereby improving immune response and suppressed viral pathogenicity in the treated turkeys when compared to 1% dietary supplementation. Subsequent studies confirmed this dose-dependent effect as a higher antibody titre was observed with 6% *Nigella sativa* dietary supplementation compared to 1% and 3% dietary supplementation (Sajid Umar, Munir, et al., 2016). These findings suggested that turkeys fed with *Nigella sativa* exhibited higher levels of cytokine gene expression, leading to increased antiviral behaviour and suppressed pathogenesis of H9N2 viruses. Another study showed that the combination

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Moreover, avian influenza virus subtype H5N1 has previously been reported to be treated with *Nigella sativa* extract. Ethanol extract of *Nigella sativa* showed moderate dose-dependent antiviral activity and prevented the replication of H5N1. Experimental works suggested that the inhibition may be mediated by increasing innate immunity (Dorra et al., 2019). However, another study found that *Nigella sativa* oil, when used as a vaccine adjuvant against H5N1, can exhibit a non-specific immunostimulant effect and induce cellular immune response that restricts the replication of H5N1 (Mady et al., 2013).

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CONCLUSION

The use of natural extracts and derivatives in disease prevention and cure has been on the increase globally due to their high tolerance and low side effects. *Nigella sativa* is a well-known plant used in folk medicine for many decades now; it is considered a "miracle herb" due to its effectiveness in managing several disease conditions. The available scientific data on *Nigella sativa* has revealed that *Nigella sativa* oil, extracts, and components, particularly thymoquinone, can serve as natural remedies for many diseases. Moreover, the extracts of *Nigella sativa* are proven to exhibit different medicinal properties even though their antiviral activity has not been fully exploited. This review focused on reviewing most of the published studies on the antiviral effects of *Nigella sativa*, especially those that demonstrated the antiviral activity of *Nigella sativa* and its bioactive compounds against the different plant, animal, and human viruses. Based

https://microbiologyjournal.org/nigella-sativa-black-seed-as-a-natural-remedy-against-viruses/

Obesity (Silver Spring). Author manuscript; available in PMC: 2021 Mar 1.

Published in final edited form as: Obesity (Silver Spring). 2020 Aug 10;28(9):1631–1636. doi: 10.1002/oby.22929

Vitamin A corrects tissue deficits in diet-induced obese mice and reduces influenza infection after vaccination and challenge

Penkert RR [1], Cortez V [1], Karlsson E [1], Livingston B [1], Surman SL [1], Li Y [3], Ross AC [3], Schultz-Cherry S [1,2], Hurwitz JL [1,2]

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PMCID: PMC7483416 NIHMSID: NIHMS1600508 PMID: 32779401

https://pmc.ncbi.nlm.nih.gov/articles/PMC7483416/

Vitamin A supplements correct deficits in lung, liver and adipose tissues in animals with obesity

To test the corrective potential of vitamin A supplements, we administered 600 IU vitamin A or PBS orally to obese and control mice on d.0, 3, 7, 21, 24, and 28. Vitamin A levels, measured in the form of retinol, were evaluated on d.35 (Figure 1). Similar to previous reports (7), we observed elevated levels of retinol in the sera and reduced levels in the tissues of obese mice compared to lean controls. Vitamin A supplementation significantly improved vitamin A levels in the lung and adipose tissues, but not in the sera or liver, of obese mice. Importantly, vitamin A levels in the lungs of supplemented DIO mice were closely matched to those of lean controls.

https://pmc.ncbi.nlm.nih.gov/articles/PMC7483416/

Supportive of our previous findings with non-obese mice (17), we found that vitamin A supplementation associated with marginally higher CD4+ and CD8+ T cell percentages among CD45+ cells in the respiratory tract (Figures 2A–B). Additionally, the percentages of $CD3^{NEG}B220^{NEG}F4/80^{+}CD11c^{HI/MED}CD11b^{LOW}SiglecF^{+}$ cells (inclusive of alveolar macrophages) were marginally improved and the percentages of $CD3^{NEG}B220^{NEG}F4/80^{+}CD11c^{HI/MED}CD11b^{HI}SiglecF^{NEG}$ cells (inclusive of interstitial macrophages and termed interstitial macrophages for simplicity (18)) were significantly reduced among $CD45^{+}$ cells in the lung (Figures 2C–D).

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Vitamin A supplements improve virus control in vaccinated mice following challenge

Mice were vaccinated via a prime-boost regimen with an inactivated influenza virus (pdmH1N1) and vitamin A or PBS was administered orally on d.0, 3 and 7 post-vaccination. Two weeks post-boost serum was evaluated for virus-specific antibodies. Overall, obese mice demonstrated a poor antibody response to vaccination compared to control mice (Figure 3). Only when vaccine was co-delivered with vitamin A were influenza-specific IgG antibody responses significantly above background (Figure 3B). Supplementation also increased IgG/IgM ratios, indicating enhanced antibody class switching (Figure 3C).

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Two weeks after the second dose of vaccine, animals were challenged with a non-lethal dose (10^6 $TCID_{50}$) of homologous influenza virus. There was transient, mild, weight loss after infection that was more pronounced in vitamin A-treated versus PBS-treated animals (Supplementary Figure 1), although absolute weights were similar between test and control groups throughout the time course. Weight loss may have reflected virus-specific immune responses (19), but significant correlations between weight loss and virus-specific antibodies were not observed (data not shown). Vaccination alone provided some protection against infection. Importantly, on d.3 post-infection vaccinated mice that received vitamin A exhibited a profound reduction in viral lung titers compared to vaccinated, unsupplemented animals (Figure 3D, $p < 0.001$).

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CONCLUSION

Vitamin A tissue deficits may be common in individuals with obesity, but masked and under-reported due to normal or above-normal serum retinol levels. Vitamin A is pleiotropic in function and influences virtually every mammalian cell, including cells involved in adaptive and innate immune responses. We show that vitamin A supplements provide benefit to individuals with obesity by correcting tissue vitamin deficits, altering lung immune cell composition, improving vaccine responses and assisting in respiratory virus clearance. These findings are particularly relevant as the world scrambles to deal with the SARS-CoV-2 pandemic. Individuals with underlying health conditions, including obesity (20), are particularly vulnerable to serious disease (COVID-19) caused by SARS-CoV-2. Our demonstration that vitamin A supplements provide protection against a respiratory virus infection may inform healthcare recommendations for prophylaxis against severe disease from respiratory viral infection in individuals with obesity.

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The effectiveness of vitamin C in preventing and relieving the symptoms of virus-induced respiratory infections

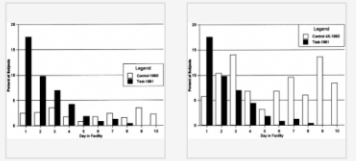
H.Clay Gorton, DC [a] · Kelly Jarvis, DC [b]

Affiliations & Notes Article Info

Abstract

Background: An ever increasing demand to evaluate the effect of dietary supplements on specific health conditions by use of a "significant scientific" standard has prompted the publication of this study. **Objective:** To study the effect of megadose Vitamin C in preventing and relieving cold and flu symptoms in a test group compared with a control group. **Design:** Prospective, controlled study of students in a technical training facility. **Subjects:** A total of 463 students ranging in age from 18 to 32 years made up the control group. A total of 252 students ranging in age from 18 to 30 years made up the experimental or test group. **Method:** Investigators tracked the number of reports of cold and flu symptoms among the 1991 test population of the facility compared with the reports of like symptoms among the 1990 control population. Those in the control population reporting symptoms were treated with pain relievers and decongestants, whereas those in the test population reporting symptoms were treated with hourly doses of 1000 mg of Vitamin C for the first 6 hours and then 3 times daily thereafter. Those not reporting symptoms in the test group were also administered 1000-mg doses 3 times daily. **Results:** Overall, reported flu and cold symptoms in the test group decreased 85% compared with the control group after the administration of megadose Vitamin C. **Conclusion:** Vitamin C in megadoses administered before or after the appearance of cold and flu symptoms relieved and prevented the symptoms in the test population compared with the control group. (J Manipulative Physiol Ther 1999;22:530–3)

Figures (2) Figure Viewer



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Treatment

Control group. The question of respiratory infections was not specifically broached with the students during the 1990 classes. Students reported symptoms of illness at their own initiative when the symptoms were severe enough to request intervention. Colds and flu were generally not reported unless the student felt physically ill. Although records were not kept of the number of students requiring bed rest, in nearly every group 1 or more students required from half a day to 3 days bed rest to recuperate from influenza. Treatment consisted of administering pain relievers and decongestants. In a few cases symptoms were severe enough to require skilled medical intervention.

Test group. During the orientation period for the 1991 classes, students were asked to report any existing cold or flu symptoms and to report the earliest signs of the onset of sore throat or nasal congestion during their stay. Anyone reporting flu symptoms was treated with 1000 mg of vitamin C per hour for 6 hours, repeating the treatment for up to 3 days, as necessary, followed by 1000 mg 3 times a day for the remainder of the training period. Students receiving the 1 g/h treatment were required to report on their symptoms at the end of each 6-hour period. All students not reporting initial symptoms were given 1000 mg of vitamin C 3 times a day.

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Test group-1991

The higher initial incidence of reported symptoms in 1991 over 1990, as shown in Fig 1, is because in 1991 the subjects were requested to report any sign of sore throat or nasal congestion on entering the facility, whereas no requests to report symptoms were made in 1990. The precipitous decrease in reported symptoms with time in the test group compared with the control group is readily apparent. The figure for day 6 represents only 2 individuals, and that for day 8 represents only 1 individual. Not a single student in the test group reported flu symptoms during the last 2 days, compared with 27 on the last 2 days in the control group. Furthermore, and of major significance, during the entire period, January to September 1991, reported symptoms were sufficiently mild that not 1 student lost any class time because of respiratory infection.

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Of 47 subjects reporting flu symptoms on entering the training facility, 23 experienced relief of symptoms with 1 6-hour treatment of 1000 mg of vitamin C per hour, 19 with 2, and 5 with 3 such treatments.

Assuming that prior infections did not endure for more than 3 days after beginning the training program, the relative effectiveness of vitamin C in preventing the onset of influenza could be quantified by dividing the normalized reported incidence of days 4 through 10 in the test group by that in the control group, which shows a remarkable reduction of infection in the test group of more than 85%.

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Conclusion

On the basis of reported subjective symptomatic relief and also on the lack of reported new symptoms of cold and flu between the control group and the test group, this study shows that megadose Vitamin C therapy can help prevent, as well as therapeutically treat, the symptoms of cold and flu.

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Vitamin C reduces the severity of common colds: a meta-analysis

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Harri Hemilä & Elizabeth Chalker

https://link.springer.com/article/10.1186/s12889-023-17229-8

Background

Randomized trials have shown that vitamin C shortens the duration of common colds. Some trials reported greater effects on severe cold symptoms compared with mild symptoms. This review systematically compares the effects of vitamin C on severe and mild common cold symptoms.

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We included all placebo-controlled trials of orally administered vitamin C in doses of at least 1 g/day for the common cold for people in good health at baseline. The analysis was restricted to trials which reported both the total duration of the common cold, and the severity of the common cold measured using severity scales, the duration of more severe stages of the cold, or proxies for severe colds such as days indoors. Findings were pooled using the inverse variance, fixed effect options of the metacont function of the R package meta to calculate the ratio of means estimate.

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Results

Fifteen comparisons from 10 trials which reported both mild and severe symptoms were identified. All trials were randomized and double-blind. Compared to placebo, vitamin C significantly decreased the severity of the common cold by 15% (95% CI 9–21%). The direct comparison of the effect of vitamin C on mild and severe symptoms was limited to five comparisons which found that vitamin C had a significant benefit on the duration of severe symptoms. In this subset, there was a significant difference in the size of the effect of vitamin C on the overall duration of colds versus the duration of severe colds ($P = 0.002$), and vitamin C had no significant effect on the duration of mild symptoms.

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Conclusions

The common cold is the leading cause of acute morbidity and a major cause of absenteeism from work and school. However, absenteeism is dependent on the severity of symptoms. The finding that vitamin C may have a greater effect on more severe measures of the common cold is therefore important. Further research on the therapeutic effects of vitamin C on the common cold should measure outcomes of differing levels of severity.

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Zinc and Respiratory Viral Infections: Important Trace Element in Anti-viral Response and Immune Regulation

Fatemeh Sadeghsoltani [1], Iraj Mohammadzadeh [2], Mir-Meghdad Safari [3], Parisa Hassanpour [1], Melika Izadpanah [4], Durdi Qujeq [5,6], Soheila Moein [7], Mostafa Vaghari-Tabari [1,8,✉]

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[97].Hemagglutinin (HA) and neuraminidase (NA) are important glycoproteins. These proteins are presented on the external surface of the virus [98]. Influenza viruses are divided into different subtypes based on HA and neuraminidase NA [99]. H1N1 and H3N2 are among the most important of these subtypes in influenza A and are considered as the main causes of seasonal influenza [100].

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The findings of an interesting study showed that zinc oxide nanoparticles have an anti-viral effect only after a viral infection of the cells, which finally leads to a decrease in viral titer [115]. Zinc appears to be able to inhibit influenza virus' RNA polymerase activity [116]. A recent study showed that zinc-finger protein ZFP36L1 has anti-viral properties and can enhance host anti-viral defense against influenza A virus by attenuating the production of viral proteins including HA, M, and NS [117]. In the previous section, we discussed the importance of zinc-finger anti-viral protein (ZAP). One study showed that the short isoform of this protein (ZAPS) could inhibit the expression of influenza viral proteins including PA, PB2, and NA [14].

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SOD1 is a crucial zinc-dependent antioxidant enzyme. It appears that this enzyme can significantly attenuate viral polymerase activity and has anti-viral properties against H1N1IAV infection. It seems that repression of the copper-zinc SOD1 enzyme by the IAV may facilitate virus replication by disrupting cell redox balance [118]. As mentioned in the previous section, ZMPSTE24 is also an important zinc-dependent protein involved in anti-viral defense and immune regulation. One study showed that IAV-infected ZMPSTE24-deficient mice had increased viral burden, cytokine production, and mortality, indicating an important role for this zinc-dependent protein in anti-viral defense, and immune regulation following IAV infection [85]. Zinc-finger CCCH-type anti-viral protein 1 (ZC3HAV1) is another zinc-dependent protein involved in the anti-viral defense of host cells. One study showed that this protein could attenuate IAV replication by increasing IFN-β expression [119]. All the results summarized above indicate the importance of zinc in the defense against influenza infection. These findings partly justify the results of clinical studies regarding the usefulness of zinc in the prevention and treatment of influenza infection.

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infections [135, 136]. As mentioned in previous sections, zinc has many essential roles in the immune system, including regulation of proliferation, differentiation, and maturation of Immune cells. Zinc is involved in the regulation of leukocytes and lymphocytes activities and modulation of inflammatory responses. It seems that zinc deficiency, which is defined as insufficient zinc for body needs, results in attenuation of immune system [5, 7].

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Although very few studies have been conducted on the importance of zinc and zinc-containing proteins in RSV infection, the findings indicate that zinc is helpful in controlling RSV infection. It seems that blood zinc level in children with RSV pneumonia is significantly low [5, 137]. In one exam, the inhibitory effects of zinc on RSV infection were seen, when incubated with human epithelial type 2 (HEp-2) cells only before infection [138]. Studies also have shown that zinc treatment enhances interferon α (IFNα) production by leukocytes. IFNα, an immune-stimulatory cytokine, has anti-viral activity. Increasing the expression of anti-viral genes by IFNα that are correlated with degradation of viral RNA as well as inhibition of viral RNA translation is proposed to be stimulated by zinc [5, 7]. The studies also reported that intake of at least 75 mg zinc per day could decrease the duration of pneumonia symptoms [139]. Therefore, it is necessary to study the relationship between zinc supplementation and RSV-induced pneumonia. One study showed that fetal ethanol

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Zinc and Vaccination Against Respiratory Viruses: Can It Be Helpful?

Undoubtedly, vaccination is one of the most effective ways to prevent infectious diseases, especially respiratory viral infections. Vaccination against the influenza virus plays an important role in preventing seasonal influenza, but an effective vaccine against RSV has not yet been approved. Several vaccines have also been developed against COVID-19 that will undoubtedly play a key role in controlling the COVID-19 pandemic. However, finding ways to increase the effectiveness of vaccines and boost the immune response following vaccination has always been considered as an important area of research. Some studies have examined the efficacy of zinc in enhancing the effectiveness of respiratory virus vaccines. The majority of studies focusing on the flu vaccine have reported conflicting findings, and it is not yet clear whether zinc can increase vaccine efficacy. A study in pigs showed that zinc oxide might help boost humoral immune responses following vaccination against swine influenza viruses. In this study, it was revealed that high doses of zinc (2500 ppm) in combination with the vaccine could significantly increase hemagglutination inhibition titers (HAI) following influenza infection [164]. Another study of 9- to 18-year-old heart disease patients found that supplementing with zinc along with the influenza vaccine could reduce the incidence of malaise, a common adverse effect of the influenza vaccine. Besides, this study showed that zinc supplementation along with influenza vaccine could significantly reduce serum levels of TNFα in these children [165]. However, studies on the elderly have

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Biochemical Pharmacology

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N-acetyl-L-cysteine (NAC) inhibit mucin synthesis and pro-inflammatory mediators in alveolar type II epithelial cells infected with influenza virus A and B and with respiratory syncytial virus (RSV)

Manuel Mata [a b c], Esteban Morcillo [b c], Concepcion Gimeno [c d], Julio Cortijo [a b c]

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For the intracellular H_2O_2 studies, cells were grown and after confluence, infected with RSV, influenza A or influenza B in the presence or absence of NAC 10 mM. 48 h later the cells were lysed and H_2O_2 concentration was estimated using the Amplex red reactive as described above. As an effect of infection, the intracellular level of hydroxide peroxide significantly increased, compared to mock treated cultures. Induction was higher in influenza A infected cells (2.76-fold increase) than in RSV (2.28-fold increase) or in influenza B (1.90-fold increase). In the three experimental groups, pre-treatment with NAC 10 mM totally abolished the increase in H_2O_2 production (Fig. 1).

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3.2. Effects of viral infection on MUC5AC expression

COPD exacerbations are characterized by different symptoms including mucus hypersecretion. To investigate the effects of viral infections in our model, A549 cells were infected with influenza virus A, B or RSV as described above in the presence or absence of NAC. We used three different doses of NAC (0.1 mM, 1 mM and 10 mM) to analyze if the effects observed were dose dependent. 48 h after infection supernatants were collected for MUC5AC protein analysis and total RNA was extracted to study the MUC5AC expression.

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NAC significantly reduces the MUC5AC expression in A549 infected cells in a dose dependent manner showing an IC_{50} of 1.3, 0.45 and 0.39 for RSV, influenza A and influenza B, respectively (Fig. 3, panels A, B and C, white bars). Similar results were observed for MUC5AC release with IC_{50} values of 0.33, 0.26 and 0.79 for RSV, influenza A and influenza B, respectively (Fig. 3, panels A, B and C, squared bars).

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3.3. Effects of viral infection on interleukin release

During exacerbations there is a release of different chemokines and cytokines from different sources including airway epithelial cells. The inhibitory effects of NAC on the release and expression of TNF-alpha, IL6 and IL8 were studied. 48 h after A549 cell infection with the viruses, culture supernatants were collected and analyzed by flow cytometry as described in Section 2. Total RNA was extracted from the cells, and the gene expression was evaluated by real-time RT-PCR. The obtained results are summarized in Fig. 4.

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NAC 10 mM pre-treatment almost abolished induction of TNF-alpha after virus infection with RSV and influenza A. In influenza B infected cells the inhibition was lower but significant compared to mock-treated cells. IL8 protein inhibition did not reach statistical significance compared to infected cells, but levels were closer to mock-treated groups (in fact there are no statistical differences between them). In the case of IL6, NAC pre-treatment totally abolished protein release in RSV infected cells and almost totally in influenza A and B cultures.

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3.5. Effects of NAC on virus replication

To evaluate the effects of NAC on virus replication, A549 cells were grown and after confluence were infected with influenza virus A, B or RSV, as described above in the presence or absence of NAC 10 mM. 48 h later, supernatants were collected and virus titres were determined as $TCID_{50}$/ml (Fig. 6). NAC 10 mM, compared to mock-treated virus control, significantly reduced the virus titre in 10.31%, 12.99% and 30.12% (percentage of inhibition) for RSV, influenza A and influenza B infected cultures respectively.

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In summary, 64% of COPD exacerbations are associated with respiratory viruses infection including RSV and influenza A and B. NAC is a glutathione precursor that reduces symptoms and exacerbations in COPD patients [41] and its beneficial effects in the treatment of COPD are well established [28]. The results of this study indicate that NAC inhibits the MUC5AC, IL8, IL6 and TNF-alpha expression that follows virus infection through mechanisms involving ROS generation and subsequent NF-κB and p38 MAPK activation. These results support the beneficial effects of NAC treatment observed in the management of COPD [28].

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Raw Bovine Lung Concentrate	200mg	†

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†Daily Value (DV) not established.

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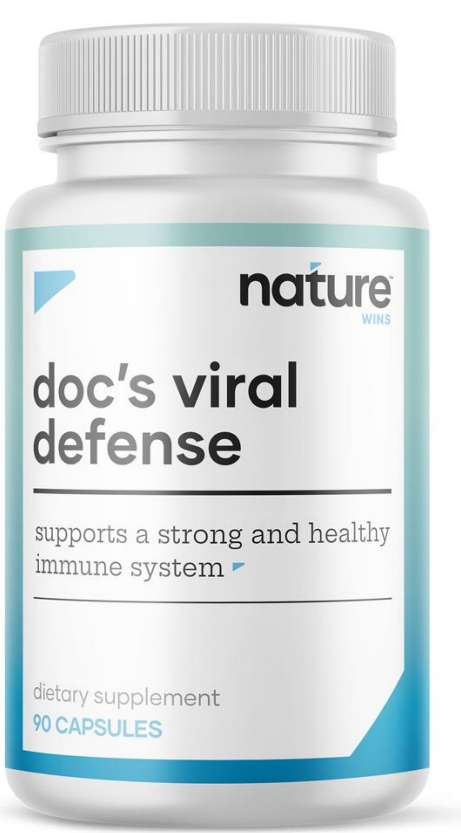

Supplement Facts

Serving Size: 3 Capsules Servings Per Container: 30

Amount Per Serving		% Daily Value
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Selenium	200mcg	364%*
N-Acetyl L-Cysteine (NAC)	1000mg	†
Quercetin	500mg	†
Betaine Anhydrouss (TMG)	200mg	†

*Percent Daily Value (DV) are based on a 2000 calorie diet.
†Daily Value (DV) not established.

OTHER INGREDIENTS: Hydroxypropyl Methylcellulose (HPMC) Vegetable Capsule, Vegetable Stearate

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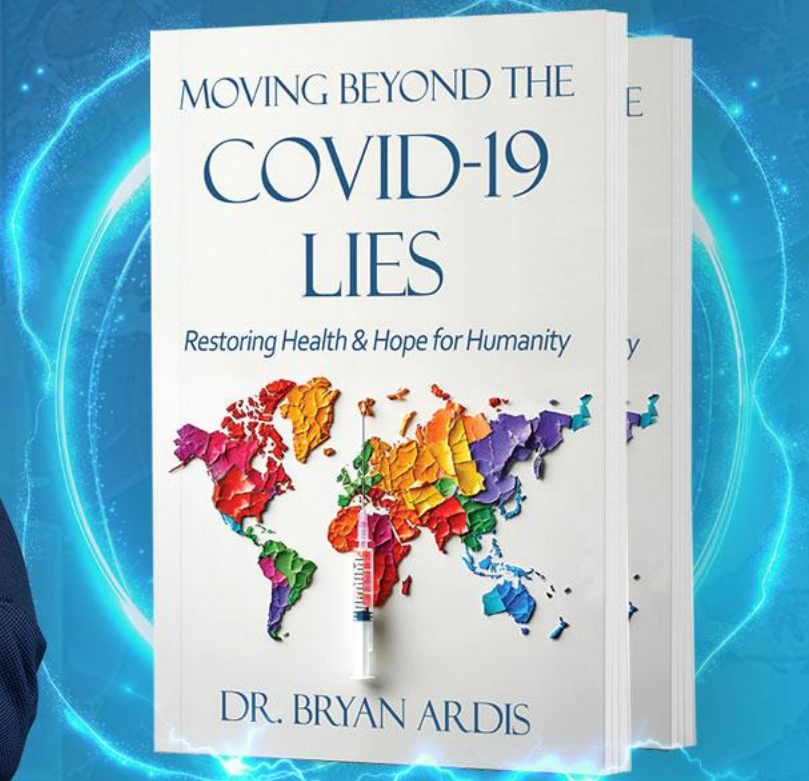

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