Vaccine Adherence: Addressing Myths and Hesitancy

full update May 2025

Determining which vaccines are appropriate for your patient is based on several factors (e.g., age, health conditions, lifestyle). Patient fears, myths, and scheduling may be barriers to vaccine adherence. Use this checklist to improve vaccination rates, increase adherence, and overcome barriers.

Goal	Suggested Approach
Identify candidates	☐ Ask about vaccine history. For example, you can ask: o "Which vaccines have you received?" o "When was your last tetanus shot?" ☐ Use these tools to stay current on available vaccines and the latest recommendations for all age groups: o **US**: https://www.cdc.gov/vaccines/. There are also online quizzes to determine needed vaccines: ☐ **Adults**: What Vaccines Are Recommended for You? (https://www.cdc.gov/vaccines-adults/recommended-vaccines/index.html). ☐ **Children and adolescents**: Your Child Needs Vaccines as They Grow! (https://www.cdc.gov/vaccines/imz-schedules/child-easyread.html) o **Canada**: https://www.canada.ca/en/public-health/services/provincial-territorial-immunization-information.html ☐ When available, review immunization registry data to determine which vaccine(s) a patient may need. ☐ Develop strategies to identify eligible patients. Consider patient ages and chronic medical conditions. For example:[1,2] o Help parents stay on track with childhood vaccinations for infants and young children. o Adolescents may need the human papilloma virus (HPV) and meningitis vaccines. o Elderly patients may be candidates for the pneumococcal or zoster vaccines. o Patients with chronic obstructive pulmonary disease (COPD), diabetes, or heart disease may need a pneumococcal vaccine. o Make sure ALL patients six months and older, including pregnant women, receive a flu vaccine yearly. ☐ Be familiar with and follow policies for giving vaccines to minors with and without parental consent. o **US**: individual state laws can be found at https://www.vaxteen.org/consent-laws-by-state. o **Canada**: check for provincial age of consent requirements, as ages may vary among provinces.
Address hesitancy Continued…	☐ Ask about vaccine hesitancy. (Example: "What keeps you or your child from getting this vaccine?") Recap what they say, in an empathetic way, so that they feel heard and validated. (Example: "It sounds like you are concerned about side effects," or "I had those same concerns.") ☐ Personalize the conversation. Share that you vaccinate your kids. Ask if they were vaccinated when they were young.

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Goal	Suggested Approach
Address hesitancy, continued	☐ Ask permission to provide facts. ("I have some information that others have found helpful. Can I share it with you?") Tailor the information you provide to address their specific concerns. ☐ **Infants**: Ease fears about the number of vaccines infants receive at one time. Evidence suggests that a healthy child's immune system will NOT be damaged or overwhelmed by receiving multiple vaccines at once.[3] ☐ **Adolescents**: Reassure that the HPV vaccine does NOT increase sexual promiscuity or sexually related outcomes (e.g., pregnancy).[4,12] ☐ **Adults**: Educate that vaccines not only prevent infections, but also significant infection-related complications. Examples: o The flu vaccine lowers the risk of flu-related complications (e.g., hospitalizations).[5] o Up-to-date COVID vaccination reduces the need for urgent care, emergency department visit, or hospitalization due to COVID-19.[14]
Ease fears about unfounded myths	☐ Ask about fears and questions. For example, you can ask, "What fears or questions do you have because of things you have heard about vaccines?" ☐ Remind patients that the flu vaccine may cause low-grade fever, mild headache, or mild muscle aches, but it does NOT cause the flu.[6] ☐ Advise patients to be skeptical of things they see on the social media about vaccines, as much of the information is false. ☐ Reassure that studies consistently show that vaccines (even old ones that had thimerosal) DO NOT cause **autism**.[7,13] The Autism Society supports the science that vaccines are NOT linked to autism.[15] o Point out that this idea was first popularized by a study that was later removed from the scientific record because it was false.[17] ☐ Explain that even vaccines produced in human cell (fibroblast) cultures (e.g., chickenpox, rubella, hepatitis A) do not contain fetal cells or parts, or anything recognizable as human DNA.[16] Although the precursors to these cells were obtained from abortions in the 1960s, major religions (including Catholicism) do not object to these vaccines.[16] These cells continue to replicate under carefully controlled lab conditions, so no new abortions are needed to make the vaccines.[16] ☐ Some prefer **natural immunity** over vaccines. It is not worth the risk, especially for some infections. o Stress the risks and complications of disease. For example: ☐ As many as about 15 anaphylactic reactions occur per million doses of MMR vaccine.[10] But up to three in 1,000 patients infected with measles will die.[8] Pneumonia occurs in up to 1 in 20 children with measles, and is the most common cause of death in young children.[8] Encephalitis, which can cause deafness or intellectual disability, occurs in about one is 1,000 children with measles.[8] ☐ In adults, up-to-date COVID-19 vaccination reduces the risk of long COVID compared to people who are unvaccinated or not up-to-date with COVID vaccination.[9]

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Goal	Suggested Approach
Improve adherence	☐ Use strong endorsements. ☐ Consider using an "opt-out" approach instead of an "opt-in" approach. o Some data suggest proactively scheduling appointments for patients (opt-out approach) to receive a vaccine increases vaccination rates compared to notifying patients that vaccination appointments can be made (opt-in approach).[11] ☐ In the US, encourage booking future vaccine doses with the first dose. Enroll patients in reminder programs (e.g., calls, texts). ☐ In Canada, follow school vaccination programs (where available) to ensure required vaccines are received on schedule. ☐ Suggest coordinating care with other providers who offer vaccines (e.g., pharmacies, other medical appointments).

Abbreviations: MMR = measles, mumps, rubella

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Resources for Discussing Medical Misinformation

This chart provides resources to help you communicate with patients about medical misinformation. Many of these resources are intended for use by the public, so you can share them with patients, or use their wording to help frame your explanations in easily understandable terms.

Resources with general tips for communicating with patients who have been exposed to confusing or inaccurate medical information

• *Messaging for Trust in Health Communication* from the Coalition for Trust in Health Information (https://trustinhealthandscience.org/wp-content/uploads/2024/11/MessagingForTrustHealth_508-1.pdf)
  o A summary wallet card is available at: https://trustinhealthandscience.org/wp-content/uploads/2024/11/MessagingTrustWalletCard-508-1.pdf.
• *A Community Toolkit for Addressing Health Misinformation* from the Office of the U.S. Surgeon General (https://www.hhs.gov/sites/default/files/health-misinformation-toolkit-english.pdf).
• *Using Psychological Science to Understand and Fight Health Misinformation*, a consensus statement from the American Psychological Association (https://www.apa.org/pubs/reports/misinformation-consensus-statement.pdf).
• *The Public Health Communications Guide to Misinformation* from Public Health Communications Collaborative (https://publichealthcollaborative.org/wp-content/uploads/2024/11/The-Public-Health-Communicators-Guide-to-Misinformation.pdf)
• *A Practical Guide to Prebunking Misinformation* from a collaboration between University of Cambridge, BBC Media Action, and Jigsaw (a team at Google)(https://prebunking.withgoogle.com/docs/A_Practical_Guide_to_Prebunking_Misinformation.pdf)
  o "Prebunking" is a preventive measure used to counter misinformation before it spreads.
• *Tackling Rumors and Understanding & Strengthening Trust (TRUST) in Public Health* from Johns Hopkins Bloomberg School of Public Health (https://centerforhealthsecurity.org/trust)

Resources and tips to combat vaccine misinformation

• General
  o Advise patients to be skeptical of things they see on the social media about vaccines, as much of the information is false.
  o Ease fears using our resource, *Vaccine Adherence: Addressing Myths and Hesitancy*.
  o See the CDC's page, *Explaining How Vaccines Work* (https://www.cdc.gov/vaccines/basics/explaining-how-vaccines-work.html).
  o To counter concerns about a link between vaccines and autism, see *Do Vaccines Cause Autism?* from Autism Speaks (https://www.autismspeaks.org/do-vaccines-cause-autism).
  o To address concerns about **fetal cells** in vaccines, see Children's Hospital of Philadelphia resource, *Vaccine Ingredients* (https://www.chop.edu/vaccine-education-center/vaccine-safety/vaccine-ingredients/fetal-tissues).
  o For patients who prefer "natural immunity" over vaccines, explain that it is not worth the risk. Out resource, *Vaccine Adherence: Addressing Myths and Hesitancy* provides examples of disease risk vs vaccine risks.
  o See the CDC's page, *How Vaccines are Developed and Approved for Use* (https://www.cdc.gov/vaccines/basics/how-developed-approved.html).

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- Flu vaccines
  - Our chart, *Communicating About Flu Vaccination*, helps answer questions about flu vaccine efficacy, use in immunocompromised or pregnant patients, and more.
  - See the CDC's *Misconceptions About Seasonal Flu and Flu Vaccines* at https://www.cdc.gov/flu/prevention/misconceptions.html to help address concerns such as getting the flu from the flu vaccine.

- COVID vaccines
  - Our chart, *COVID-19 Vaccines* (US)(Canada) has a frequently asked question section that addresses safety and efficacy questions.
  - The CDC's *COVID-19 Vaccine Basics* has an infographic to help explain how mRNA vaccines work (https://www.cdc.gov/covid/vaccines/how-they-work.html).

- Childhood vaccines
  - See the CDC's *Multiple Vaccines at Once* (https://www.cdc.gov/vaccine-safety/about/multiples.html).
  - To counter concerns about a link with autism, see *Do Vaccines Cause Autism?* from Autism Speaks (https://www.autismspeaks.org/do-vaccines-cause-autism).
  - *Talking to Patients About Measles, Vitamin A and the Importance of Vaccination* is available from the Infectious Diseases Society of America at https://www.idsociety.org/science-speaks-blog/2025/talking-to-patients-about-measles-vitamin-a-and-the-importance-of-vaccination/.

Resources regarding supplements

- General
  - Look up information about safety and efficacy of specific supplements using our *NatMed* database.
  - Dietary Supplement Fact Sheets are available from the NIH's Office of Dietary Supplements (https://ods.od.nih.gov/factsheets/list-all/).

- Supplements for infectious diseases (e.g., colds, flu)
  - See *Dietary Supplements for Immune Function and Infectious Diseases* fact sheets from the NIH's Office of Dietary Supplements for healthcare professionals (https://ods.od.nih.gov/factsheets/ImmuneFunction-HealthProfessional/) and patients (https://ods.od.nih.gov/factsheets/ImmuneFunction-Consumer/).
  - See Dietary Supplements in the Time of COVID-19 fact sheet from the NIH's office of Dietary Supplements for healthcare professionals (https://ods.od.nih.gov/factsheets/COVID19-HealthProfessional/).

- Supplements for brain health
  - Our chart, *Alzheimer's Disease Pharmacotherapy* has a section on natural products for dementia.

- Supplements and fad diets for weight loss
  - See Dietary Supplements for Weight Loss fact sheets from the NIH's Office of Dietary Supplements for healthcare professionals (https://ods.od.nih.gov/factsheets/WeightLoss-HealthProfessional/) and patients (https://ods.od.nih.gov/factsheets/WeightLoss-Consumer/).
  - See *Staying Away from Fad Diets* from the Academy of Nutrition and Dietetics (https://www.eatright.org/health/wellness/diet-trends/staying-away-from-fad-diets).

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Resources regarding generic and biosimilar drugs
• To help explain the benefits of generic drugs to your patients, the FDA has patient education materials available at https://www.fda.gov/drugs/generic-drugs/patient-education. • Get our FAQ, *Facts About Biosimilars*. • To learn more about the approval process for biosimilars, see information from the FDA at https://www.fda.gov/drugs/biosimilars/review-and-approval.
Resources regarding the FDA prescription drug approval process
The FDA has several resources that are appropriate for patients, including: • Frequently Asked Questions About the FDA Drug Approval Process (https://www.fda.gov/drugs/special-features/frequently-asked-questions-about-fda-drug-approval-process). • Video series: *Overview of Our Role Regulating and Approving Drugs* (https://www.fda.gov/drugs/information-consumers-and-patients-drugs/overview-our-role-regulating-and-approving-drugs-video-series).
Resources regarding sunscreens
• Get our FAQ, *Shedding Light on Questions About Sunscreens*.

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Communicating About Flu Vaccination

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The following chart answers frequently asked questions about flu vaccine efficacy, administration with other vaccines, use in patients who are immunocompromised or pregnant, and more. For information on specific influenza vaccine products, see our resource, Flu Vaccines (US) (Canada).

Question	Answer/Pertinent Information

Who should receive a flu vaccine?	• Flu vaccination is recommended for **everyone ≥6 months** without contraindications.[1,2,34-36]
	  ○ Per Canadian guidelines, influenza vaccination is particularly recommended for:[1]
	  ▪ people at high risk of severe disease, flu-related complications or hospitalization.
	  ▪ people capable of transmitting flu to those at high risk.
	  ▪ people who provide essential community services.
	  ▪ people with increased risk of exposure (occupational or recreational) to avian influenza A.
	• For patients who cannot remember if they received this season's flu vaccine, avoid missed opportunities to vaccinate by giving the flu vaccine even if this means giving a second dose to some patients.[3]

Which flu vaccine is preferred?	• Avoid delaying vaccination in order to use a specific "preferred" flu vaccine.[1,4,36] • A higher-dose, adjuvanted, OR recombinant flu vaccine is preferred (if available) for patients ≥65 years old.[1,3,36] • In Canada, there is **no longer a preference** for quadrivalent flu vaccines over trivalent flu vaccines in children.[1]
When are two doses of a flu vaccine needed?	• To provide optimal protection, **children 6 months through eight years** should receive two doses of flu vaccine (separated by at least four weeks) if they have not received at least two doses of flu vaccine (separated by at least four weeks) prior to July 1 of the current year (US) or if they have not previously received the seasonal flu vaccine (Canada).[1,4,34,35] ○ US guidance specifies that for children who should receive two doses, if the child turns nine years old between doses one and two of the vaccine, two doses are still recommended.[4]

When should flu vaccines be given?	• **In the US**, encourage vaccination by the end of October. Generally, avoid starting vaccinations before September, due to the possibility of reduced effectiveness later in the flu season.[4]
	  ○ Consider earlier vaccination in children (especially if they require two doses), and in pregnant patients, especially those in the third trimester and those with additional risk factors (e.g., asthma, heart disease).[4,14,17,31]
	• **In Canada**, start vaccinations as soon as possible based on availability.[1]
	• Don't miss an opportunity to vaccinate due to fears the vaccine's effectiveness will not last throughout the entire flu season.
	  ○ Though delayed vaccination may lead to increased immunity later in the season, it can lead to missed opportunities to vaccinate, and is not recommended.[1,6]
	  ▪ Booster doses are NOT recommended later in the season for patients who receive their vaccine early in the season.[1,3]
	• Continue to vaccinate as long as flu viruses are circulating and unexpired vaccine is available.[1,3]

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Question	Answer/Pertinent Information
Can flu vaccines be given with other vaccines?	• Live-attenuated and inactivated flu vaccines can be given with other vaccines (including COVID-19 vaccines), using separate administration sites (preferably different limbs).[1,2,7] o If two live vaccines (including FluMist) are NOT given on the same day, they should be administered at least four weeks apart.[7] (Canada: Despite the theoretical risk of immune interference (and reduced efficacy), due to lack of data and based on expert opinion, NACI recommends that FluMist can be given together with or at any time before or after any other live-attenuated or inactivated vaccine.[1]) • Data are limited for coadministration of two adjuvanted vaccines (e.g., Fluad, Heplisav-B, Shingrix).[1,4] There are theoretical concerns about more side effects. If a patient is receiving another adjuvanted vaccine, don't delay flu vaccination if an adjuvanted flu vaccine (i.e., Fluad) is the only flu vaccine available.[4]
Can the flu vaccine be given to someone who is acutely ill?	• **Continue to give the flu vaccine to most patients with mild (and moderate in Canada) acute illnesses** to avoid missed opportunities to vaccinate.[1,8] Most acute illness with or without fever (e.g., diarrhea, upper respiratory infection) is not a contraindication to receiving the vaccine.[1,9] • Severe (and moderate in the US) acute illness is a precaution for administering any vaccine.[9,10] Vaccination side effects (e.g., fever, malaise) may make it difficult to assess management of acute illness.[8] In the US, it is recommended that vaccination be deferred in patients with moderate to severe acute illness.[8] In Canada, expert opinion is recommended to assess risks and benefits if there is a high-risk exposure situation or a short window of opportunity for vaccine administration.[10]
Can immuno-compromised patients receive the flu vaccine?	• **Immunocompromised patients** may receive any licensed, recommended, age-appropriate **injectable** flu vaccine.[1,4] o See detailed guidance for the timing of influenza vaccination with specific conditions.[4] o Note that some experts recommend a high-dose or adjuvanted flu vaccine for immunocompromised patients. These vaccines may lead to an improved antibody response compared to standard-dose vaccines in these patients. However, evidence is lacking to show that this antibody response correlates with better protection against flu.[11-13] • In the US, high-dose and adjuvanted flu vaccines are acceptable options for solid organ transplant recipients (18 to 64 years) who are taking immunosuppressants, without a preference over other inactivated or recombinant influenza vaccines.[16,34-36] • Live attenuated influenza vaccine (LAIV) should be **avoided** in immunocompromised patients.[8]
Can pregnant or lactating patients receive the flu vaccine?	• Vaccinate **pregnant patients** (any trimester) with any licensed, recommended, age-appropriate **injectable** flu vaccine.[1,5,14,31,34-36] o Risk of flu and potential complications in pregnant patients and/or the fetus exceeds possible risks associated with flu vaccination.[15] • Vaccinate post-partum patients who did not receive a flu vaccine while pregnant, especially if breastfeeding an infant less than six months old, as these infants are too young to receive a flu vaccine.[5,14,17,31] o Either non-live influenza vaccines or LAIV can be used in breastfeeding patients.[18] ▪ FluMist is an option for breastfeeding patients younger than 50 years (younger than 59 years [Canada]), if there are no other contraindications.[1,19]

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Question	Answer/Pertinent Information
What is the status of thimerosal in flu vaccines?	• Thimerosal (an ethylmercury-containing preservative) is used in some multi-dose influenza vaccine vials (varies by manufacturer). • In June 2025, ACIP voted to no longer recommend the use of thimerosal-containing multi-dose vials of influenza vaccine.[29] However, CDC continues to state that there is no evidence of harm caused by the low amounts of thimerosal in vaccines (except for potentially minor reactions of redness and swelling at the injection site).[32] • The American College of Obstetricians and Gynecologists (ACOG), The American Academy of Pediatrics (AAP), and WHO all continue to support the use of thimerosal as a preservative in multi-dose vials of influenza vaccine (including for pregnant patients).[17,30,31] • Methylmercury is the type of mercury that is found in the food chain (e.g., in some fish) and is toxic to humans at high levels. Ethylmercury (found in thimerosal) is metabolized and excreted much faster compared to methylmercury, making it much less likely to accumulate or cause harm.[33]
Can patients with an egg allergy receive a flu vaccine?	• Patients with a history of severe egg allergy (symptoms more severe than hives [e.g., angioedema, respiratory distress, requiring epinephrine]) do not have higher reaction rates to egg-containing vaccines compared to non-egg allergic patients.[4] • Patients with an egg allergy may receive any age-appropriate flu vaccine, including *FluMist*, without prior flu vaccine skin test and with the full dose, irrespective of a past severe reaction to egg, and in any setting where vaccines are routinely administered.[1,4,34-36] • Refer to our resource, *Flu Vaccines* (US) (Canada), to compare formulations, including egg-free vaccine options.
Should unvaccinated people who had the flu this season still get the flu vaccine?	• Yes. Vaccinate unvaccinated people who have already had the flu during this season. The vaccine might protect against other circulating flu viruses.[3]
How effective are flu vaccines?	• During seasons when flu vaccine virus components are similar to circulating strains, flu vaccination is typically about 40% to 60% effective (e.g., reduces flu illness, doctor visits, reduces laboratory confirmed flu).[20] ○ Influenza vaccination reduces the risk of severe flu, ICU admission, and death, even when the vaccine is not perfectly matched with that particular years' circulating flu strains.[21,22] • Higher dose or adjuvanted flu vaccines seem more effective than standard-dose flu vaccines for patients 65 years and older, especially at reducing flu-related hospitalizations.[23] • Trivalent Fluzone High-Dose provided modestly greater protection against lab-confirmed influenza vs standard-dose trivalent vaccine in patients ≥65 years of age (n=31,989; NNT=200), [Evidence Level A-1].[24]

Continued…

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Question	Answer/Pertinent Information
How effective are flu vaccines, continued	• Recombinant flu vaccine (e.g., Flublok [US], Supemtek [Canada]) may be slightly more effective in preventing lab-confirmed influenza compared to non-recombinant inactivated flu vaccines in patient ≥50 years of age (N=8,604; NNT=100), [Evidence Level A-1].[25] • *Fluad*, an adjuvanted vaccine, may provide modestly greater protection against lab-confirmed influenza vs non-adjuvanted trivalent vaccine in patients ≥65 years of age (n=227; unable to calculate NNT), [Evidence Level B-2].[27]
Who should NOT receive the LIVE-attenuated flu vaccine (FluMist)?	• AVOID use of the live-attenuated flu vaccine (FluMist) in the following patients: o patients with a history of severe allergic reaction to any flu vaccine or component (excluding egg).[34-36] o children younger than 2 years (and, in the US: 50 years and older).[1,19,36] o anyone who is pregnant.[1,19,34-36] o adults or children with contraindications to live vaccines (e.g., certain chronic diseases, immunosuppression, severely immunosuppressed close contacts).[1,19,34-36] o adults or children who recently took an antiviral (**see row below** "Can the LIVE-attenuated flu vaccine (FluMist) be given to someone who received an antiviral?").[1,19,34-36] o adults or children with asplenia, a non-functional spleen, cochlear implants, or active cerebrospinal fluid leaks (US).[19,34-36] o children between the ages of 2 and 4 years with a history of asthma or wheezing(US).[19.34,35] o severe asthma or medically-attended wheezing within the previous seven days (Canada).[1] o children and adolescents on chronic aspirin or salicylate therapy.[1,19,34,35] If aspirin therapy is needed, aspirin can be started at least four weeks after administering the live-attenuated flu vaccine.[26] o close contacts of patients who are severely immunocompromised (i.e., who requires a protected environment).[1,19,34-36] US guidance recommends avoiding contact with severely immunocompromised patients for 7 days after receiving the live-attenuated flu vaccine.[19.34-36] o significant nasal congestion.[1]
Can the LIVE-attenuated flu vaccine (FluMist) be given to someone who received an antiviral?	• Most advise avoiding FluMist within 48 hours of an antiviral.[1] However, based on antiviral half-lives, it is possible antivirals could interfere with FluMist effectiveness if FluMist is given within the following timeframes BEFORE or AFTER an antiviral:[19] o 48 hours (oseltamivir and zanamivir) o five days (peramivir [approved but not marketed in Canada]) o 17 days (baloxavir) • In Canada, if a patient must take a flu antiviral within two weeks of vaccination with FluMist, it is recommended they be revaccinated with an age-appropriate injectable flu vaccine (or with FluMist based on the timing listing above).[1]

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Question	Answer/Pertinent Information
How can FluMist be given at home (US)?	• In the US, FluMist is available via online pharmacies for administration at home.[28] FluMist is also still available in offices and pharmacies for administration by a healthcare professional. • The patient's insurance may cover the cost of FluMist, but there is also an out-of-pocket shipping and processing fee.[28] • FluMist must be refrigerated and is delivered in temperature-controlled packaging.[28] The used, empty sprayers should be returned using a supplied prepaid return envelope.[28] • Confirmation of administration should be sent through the Immunization Information Systems (IIS).

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Levels of Evidence

In accordance with our goal of providing Evidence-Based information, we are citing the **LEVEL OF EVIDENCE** for the clinical recommendations we publish.

Level	Definition	Study Quality
A	Good-quality patient-oriented evidence.*	1. High-quality randomized controlled trial (RCT) 2. Systematic review (SR)/Meta-analysis of RCTs with consistent findings 3. All-or-none study
B	Inconsistent or limited-quality patient-oriented evidence.*	1. Lower-quality RCT 2. SR/Meta-analysis with low-quality clinical trials or of studies with inconsistent findings 3. Cohort study 4. Case control study
C	Consensus; usual practice; expert opinion; disease-oriented evidence (e.g., physiologic or surrogate endpoints); case series for studies of diagnosis, treatment, prevention, or screening.	

***Outcomes that matter to patients** (e.g., morbidity, mortality, symptom improvement, quality of life).

[Adapted from Ebell MH, Siwek J, Weiss BD, et al. Strength of Recommendation Taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. Am Fam Physician 2004;69:548-56. https://www.aafp.org/pubs/afp/issues/2004/0201/p548.html.]

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