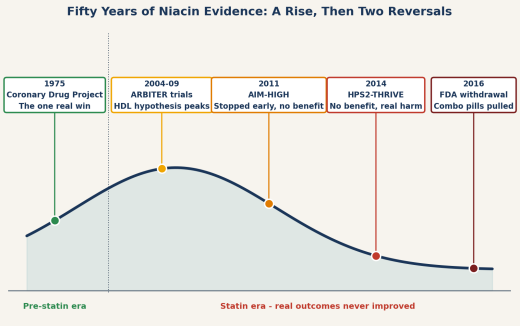
Understanding Niacin (Vitamin B3)

Why the drug that raises 'good' cholesterol never lowered heart attacks

A better lab number is not the same as a healthier heart. Niacin is the clearest proof we have.



Online: https://go.riasalimd.com/niacin-guide

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Names & Terms You Will Hear

Term	Meaning
Niacin, or nicotinic acid.	The drug name for vitamin B3. High doses treat cholesterol.
Vitamin B3, or vitamin B-3.	The vitamin family name. Everyone needs a small amount from food.
Immediate-release niacin (Niacor).	The fastest-acting form. It causes the most flushing.
Extended-release niacin (Niaspan).	A once-daily form. Usually the preferred choice.
Sustained-release niacin (Slo-Niacin, Endur-acin).	An over-the-counter, slow-dissolving form. It carries the highest liver risk.
Advicor, niacin ER plus lovastatin.	A combination pill. Pulled from the US market in 2016.
Simcor, niacin ER plus simvastatin.	A second combination pill. Also pulled from the US market in 2016.
Tredaptive or Cordaptive, niacin plus laropiprant.	Niacin paired with a flush-blocking drug. Suspended across Europe in 2013.
Niacinamide, or nicotinamide.	NOT the same drug for cholesterol. It has no meaningful lipid effect.
Inositol hexanicotinate.	Sold as 'flush-free' or 'no-flush' niacin. It does not meaningfully lower cholesterol.
Nicotinamide riboside, or NMN.	NAD+ supplements sold for energy and longevity. Not lipid drugs.
GPR109A, also called HM74A.	The receptor niacin activates on skin cells. It causes the flush.
DGAT2.	A liver enzyme niacin blocks. This step lowers VLDL and LDL.

Term	Meaning
Lp(a), or lipoprotein(a).	A cholesterol particle set mostly by your genes. Niacin is one of the few drugs that lowers it.
AIM-HIGH, HPS2-THRIVE, and CDP.	The names of the major niacin trials in this guide, from 2011, 2014, and 1975.

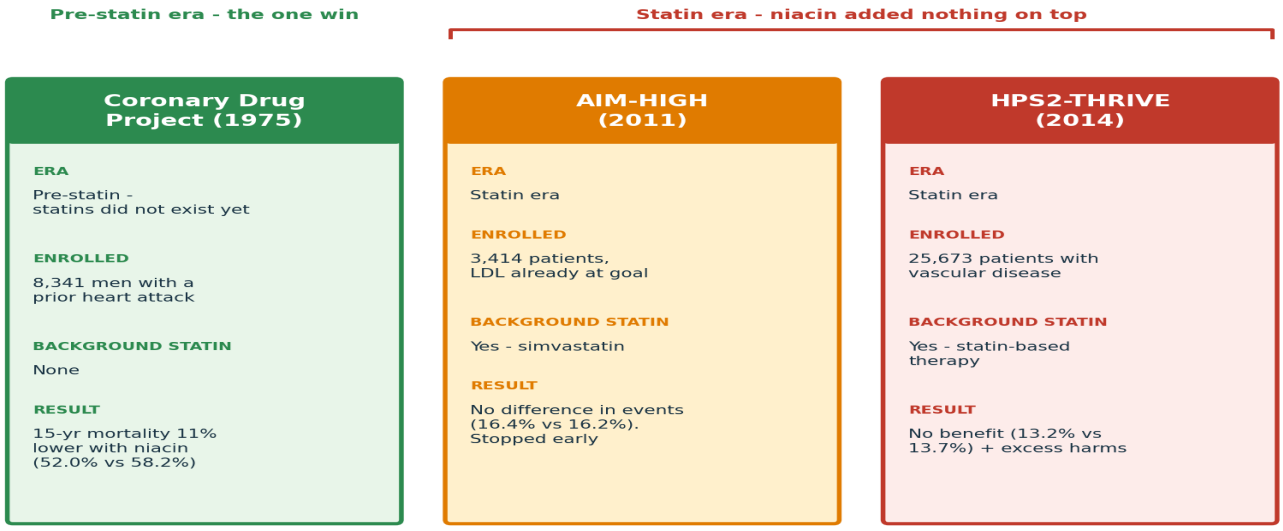
Three names get confused with niacin for cholesterol. None of them are it.
Niacinamide: treats deficiency. No cholesterol effect.
Inositol hexanicotinate, sold as "flush-free" niacin: does not lower cholesterol.
Nicotinamide riboside or NMN: sold for energy and longevity, not a lipid drug.
If the bottle does not say "niacin" or "nicotinic acid," it is not this drug.

What Is Niacin (Vitamin B3)?

- Niacin is vitamin B3. Your body needs a small daily amount, about 14 to 16 mg, to turn food into energy.
- At much higher doses, 1,500 to 2,000 mg a day, niacin also changes blood lipids. It raises HDL more than any other common drug. It also lowers LDL, triglycerides, and Lp(a).
- For decades, doctors prescribed high-dose niacin hoping it would prevent heart attacks. This idea is called the 'HDL hypothesis.'
- Large, rigorous trials tested that idea directly. Adding niacin to a working statin did not lower heart attacks, strokes, or deaths.
- Niacin is no longer FDA-approved combined with a statin. Current guidelines do not recommend it for routine heart protection.
- Niacin still has a narrow, real role. It treats true vitamin B3 deficiency. It also helps a few patients with severe triglycerides who cannot tolerate better-studied drugs.

Why It Matters

- For decades, doctors believed low HDL directly caused heart disease. A pill that raised HDL seemed like it should prevent heart attacks. Niacin raises HDL more than any other common drug.
- Niacin is cardiology's clearest example of a drug that improved a lab report without improving what matters: fewer heart attacks, strokes, and deaths.
- The 1975 win described below happened before statins existed. Once statins arrived, adding niacin on top added nothing in every large trial that followed.
- Two of the most rigorous niacin trials ever run, AIM-HIGH and HPS2-THRIVE, both added niacin to a statin. Neither found fewer heart attacks or strokes. HPS2-THRIVE also found real harm.
- This history changed how doctors think about lab numbers. A blood test moving the 'right' way is a clue. It is not proof that a drug helps you live longer.



Three landmark niacin trials, fifty years apart. The one clear win happened before statins existed. Once a statin was already treating LDL, niacin added nothing.

1975: The Coronary Drug Project, Niacin's One Real Win

- The Coronary Drug Project ran from 1966 to 1975. It randomized 8,341 men with a prior heart attack to niacin, other lipid drugs, or placebo.
- This was entirely before statins existed. There was no other strong way to lower LDL at the time.
- The original results showed a modest drop in repeat heart attacks with niacin.
- A bigger finding came later. A 1986 follow-up found 15-year mortality was 11% lower with niacin than placebo, 52.0% versus 58.2%.
- This result built niacin's reputation. It is the only large trial that ever showed a mortality benefit, and it happened with no statins to compare against.

The HDL-Hypothesis Years: 'Raise the Good Cholesterol'

- Through the 2000s, doctors believed low HDL directly caused heart disease. A drug that raised HDL seemed like it should prevent heart attacks.
- ARBITER-2 (2004) and ARBITER-6-HALTS (2009) tested niacin added to a statin. Both used an ultrasound measure of artery-wall thickness as a stand-in for real heart attacks.
- ARBITER-2 found HDL rose 21% with niacin. The artery-wall measurement stayed flat with niacin and worsened with placebo, but the overall difference was not statistically significant.
- ARBITER-6-HALTS found niacin beat the drug ezetimibe on the same measurement. It was stopped early once that difference appeared.
- Both trials measured a stand-in, not actual heart attacks or strokes. That difference mattered once the bigger trials arrived.

2011-2014: Two Definitive Trials, No Benefit

- AIM-HIGH (2011) randomized 3,414 patients already on a statin, with LDL already at goal. Niacin raised HDL and lowered triglycerides further.
- The trial was stopped early. After about 3 years there was no difference in heart attacks, strokes, or cardiac deaths, 16.4% versus 16.2%.
- HPS2-THRIVE (2014) was far larger: 25,673 patients, followed almost 4 years. Niacin again improved LDL and HDL, and again showed no drop in major vascular events, 13.2% versus 13.7%.
- HPS2-THRIVE also found real harm. More new diabetes, and more serious stomach, muscle, skin, infection, and bleeding problems, with niacin than placebo.
- Both trials tested the exact situation many patients were in: a working statin, with niacin added for low HDL. Neither found a benefit worth the risk.

The Aftermath: Withdrawals and a New 2024 Signal

- The HPS2-THRIVE result moved fast into regulatory action. Europe suspended niacin-laropiprant products, Tredaptive and its twins, starting January 2013 and finalized in March 2013.
- In the US, the FDA withdrew the niacin-statin combination pills Advicor and Simcor on April 18, 2016. It cited the AIM-HIGH and HPS2-THRIVE evidence.
- Both products had already left pharmacy shelves in late 2015.
- Current cholesterol guidelines reflect this evidence. Niacin has only a mild LDL effect. Trials do not support adding it to a statin for routine prevention.
- In 2024, Cleveland Clinic researchers linked a niacin breakdown product called 4PY to higher rates of heart attack, stroke, and death. It also promoted blood-vessel inflammation in lab studies.
- This 2024 finding is an early signal, not a finished story. It has not changed any guideline. It may explain, at a biology level, why niacin's HDL boost never helped patients.

Risk Factors

Some situations raise your risk of harm from niacin. Knowing yours helps your care team watch more closely.

Risk Factor	Why It Increases Risk
Already on a statin with LDL at goal.	This is the exact case tested in AIM-HIGH and HPS2-THRIVE. Niacin added no further protection.
Diabetes or prediabetes.	Niacin raises blood sugar. HPS2-THRIVE found more new diabetes diagnoses with niacin.
Gout or high uric acid.	Niacin can raise uric acid and trigger gout flares.
Liver disease or heavy alcohol use.	Niacin is processed by the liver. Sustained-release forms carry the most risk here.
Taking simvastatin or lovastatin.	The FDA label warns that niacin raises muscle-injury risk with these two statins.
Active or past peptic ulcer disease.	Niacin can reactivate ulcers. Active ulcers are a contraindication on the FDA label.
Buying niacin over the counter.	OTC niacin has no medical supervision of dose or form. Patients often pick the riskiest or the least useful form by accident.

Treatment Options

- Niacin is no longer FDA-approved as a combination pill with a statin. Advicor and Simcor were pulled from the US market in 2016.
- Doctors prescribe niacin today for two narrow reasons. One is a confirmed niacin deficiency. The other is severe triglycerides that other drugs have not controlled.
- Extended-release niacin, such as Niaspan, is usually preferred. It causes less liver injury than sustained-release forms.
- Dosing starts low, often 500 mg. It increases slowly over several weeks, toward 1,500 to 2,000 mg a day.
- A low dose of aspirin about 30 minutes before your niacin dose can blunt the flush.
- Blood tests check your liver, blood sugar, and uric acid before starting niacin, and periodically afterward.
- If you already take over-the-counter niacin, bring the bottle to your next visit. We need to know exactly which form and dose you take.

The Niacin Forms, Compared

Form	Lipid Effect	Flushing	Liver Risk	Verdict
Immediate-release (Niacor)	Full effect: raises HDL, lowers LDL and triglycerides	Most of all forms	Lowest of the three prescription forms	Works, but flushing limits use
Extended-release (Niaspan)	Full effect, dose-dependent	Less than immediate-release	Low to moderate	Best balance - the usual choice
Sustained-release (Slo-Niacin - OTC)	Full effect	Least of the three	Highest - avoid swapping in for immediate-release	Most liver risk for the flushing it saves
Flush-free (inositol hexanicotinate)	None shown in trials	Minimal	Low	Does not lower cholesterol - skip it
Niacinamide (nicotinamide)	None - a different drug entirely	None	Low	Not a cholesterol drug at all

Related Guides

- Lp(a), the particle niacin also lowers: see the Lipoprotein(a) guide.
- Statins, the foundation of cholesterol treatment: see the Statins guide.
- High triglycerides on their own: see the Triglycerides guide.
- What your cholesterol panel means: see the Understanding Cholesterol guide.
- Supplements people try for their heart: see the Dietary Supplements & Heart Health guide.

Comfort Measures at Home (No Medication Needed)

These simple steps support healing and ease symptoms. Use them alongside any medication your doctor prescribes.

- Take your dose with a low-fat snack, not on an empty stomach. This alone reduces flushing for many people.
- Skip hot showers, hot drinks, spicy food, and alcohol around dose time. All of these make the flush worse.
- A bedtime dose lets most of the flush happen while you sleep.
- Start low and go slow. Rushing the dose increase is the most common reason people quit niacin.
- Do not switch niacin brands or forms without checking with your doctor. The forms are not interchangeable at the same dose.
- Keep every lab appointment. Liver, blood sugar, and uric acid checks catch problems early.

Risks, Benefits, and Alternatives

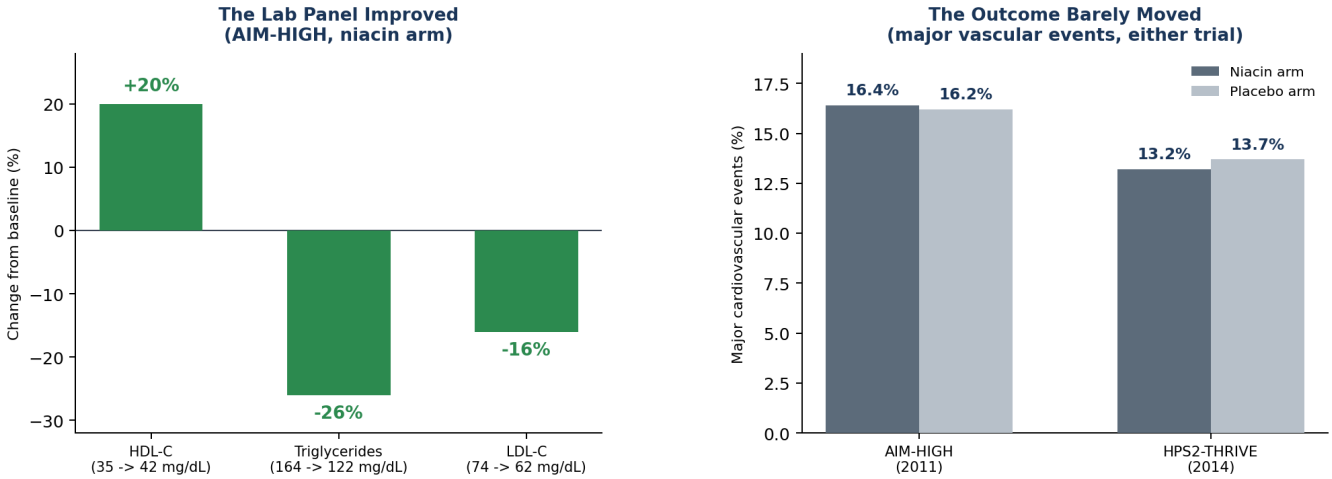
Every choice has trade-offs. Use this table to start the shared decision conversation.

Option	Risks	Benefits	Alternatives
Prescription niacin added to a statin for low HDL or high triglycerides.	Flushing and itching. Liver enzyme changes, more with sustained-release. Raised blood sugar and uric acid. Upset stomach. Can worsen ulcers. Rare vision changes. Higher muscle-injury risk with certain statins.	Raises HDL more than any other common drug. Lowers Lp(a) too. None of this lowered heart attacks or strokes in the largest trials.	A statin alone, at the right dose. Ezetimibe or a PCSK9-class drug if LDL is not at goal. Icosapent ethyl or a fibrate for high triglycerides.
Niacin for a confirmed vitamin B3 deficiency.	Flushing at high doses. The deficiency itself can be severe if it is missed.	Directly corrects a true nutrient deficiency, usually fast.	Niacinamide, which fixes the deficiency without flushing or a cholesterol effect.
Niacin for severe triglycerides, when other drugs are not enough.	The same side effects listed above: liver, blood sugar, uric acid, stomach, flushing.	Can lower triglycerides further after a fibrate, omega-3, and statin have not done enough.	Icosapent ethyl and fibrates are usually tried first.
Self-treating with over-the-counter niacin.	No monitoring of your liver, blood sugar, or uric acid. Easy to pick the wrong form by accident.	None proven. This is the unsupervised pattern that has not prevented heart attacks in any modern trial.	Talk with your cardiologist about whether any cholesterol drug is right for you.

Common Misconceptions

Myth	Reality
It raises 'good' cholesterol, so it must help my heart.	Raising HDL with niacin did not lower heart attack or stroke risk in the largest trials. A better lab number is not the same as a better outcome.
Flush-free niacin is the same thing, just gentler.	'Flush-free' niacin does not meaningfully change cholesterol in trials. It is a different molecule.
It's a vitamin, so any dose is safe.	Your body needs about 14 to 16 mg a day. Cholesterol doses are 1,500 to 2,000 mg, over 100 times higher, with real risks.
Niacinamide works the same way for cholesterol.	Niacinamide treats vitamin B3 deficiency well. It has no meaningful cholesterol effect.
The flush means it's working.	Flushing comes from a separate skin reaction. It does not track with how well your lipids are responding.
If my doctor won't prescribe niacin, something is being withheld.	The opposite is true. Niacin was tested in tens of thousands of patients. That evidence is why it is no longer used routinely.

A Great Lab Panel, an Unchanged Outcome



In AIM-HIGH, niacin moved every lipid number in the right direction. Heart attacks and strokes barely moved at all, in AIM-HIGH or HPS2-THRIVE, and neither trial's small gap between the bars was statistically significant.

Possible Complications

Knowing what can go wrong helps you spot problems early. Most complications are uncommon, especially with treatment.

Where / What	What Can Happen
Hepatic, the liver.	Liver enzyme changes. Rarely, severe liver injury. Risk is highest with sustained-release niacin.
Endocrine and metabolic.	Raised blood sugar. New-onset diabetes. HPS2-THRIVE found both more often with niacin.
Musculoskeletal.	Muscle injury, called myopathy. Rarely, a severe form called rhabdomyolysis. Risk is highest with simvastatin or lovastatin.
Renal and rheumatologic.	Raised uric acid. Gout flares.
Gastrointestinal.	Upset stomach. Niacin can reactivate peptic ulcers. Active ulcers are a contraindication.
Ophthalmologic, the eyes.	Blurred vision. Rarely, swelling in the back of the eye. Both usually reverse if caught early.
Dermatologic, the skin.	Flushing and itching. The most common side effect. It usually eases with continued use.
Bleeding and infection.	An unexpected finding in HPS2-THRIVE: more serious bleeding and infections with niacin.

Points to Know

If you remember nothing else, remember these key points.

- Niacin at vitamin doses, about 14 to 16 mg, has nothing to do with the much higher cholesterol-drug doses in this guide.
- 'Flush-free' niacin and niacinamide do not meaningfully lower cholesterol.
- Raising HDL with niacin has not been shown to lower heart attack or stroke risk on top of a statin.
- Niacin-statin combination pills, Advicor and Simcor, were pulled from the US market in 2016.
- Sustained-release, over-the-counter niacin carries the highest liver risk of any form.
- Never start, stop, or switch niacin forms without talking to your doctor.
- Aspirin about 30 minutes before a dose can blunt the flush.
- Niacin still has a real, narrow role: true deficiency, and select severe triglycerides.

When to Call Us - and When to Call 911

If you are not sure, call. We would rather hear from you twice than miss a real problem.

- New yellow skin or eyes, dark urine, or unusual tiredness. Call us the same day.
- New muscle pain, tenderness, or weakness, especially with a statin. Call us today.
- Blurred vision or a new blind spot. Call us for a prompt eye check.
- Joint pain and swelling, especially the big toe. Call us.
- Black stools, vomiting blood, or severe stomach pain. Call 911 or go to the ER.
- New or worse thirst and urination with diabetes or prediabetes. Call us.
- Questions about switching niacin forms, doses, or OTC niacin. Call us before making a change.

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Trusted Resources

The links below are the trusted resources Dr. Ali used to write this guide and that he recommends you visit for more information. Each is a clickable link in the digital version and a Short.io tracked URL on the printed version.

- Mayo Clinic - Niacin to Improve Cholesterol Numbers - Patient-friendly overview of prescription niacin for cholesterol, dosing, and side effects.
- MedlinePlus - Niacin for Cholesterol - US National Library of Medicine patient instructions, including the current evidence that niacin does not add benefit to statin therapy.
- Cleveland Clinic - Niacin (Vitamin B3): Uses and Benefits - Overview of niacin's vitamin and prescription uses, dosing forms, and precautions.
- NIH Office of Dietary Supplements - Niacin Fact Sheet for Consumers - Federal reference on niacin's role as a vitamin, dietary sources, and the flushing reaction at supplement doses.

Sources Used to Build This Guide

Every recommendation in this guide is grounded in one or more of the studies, guidelines, or trusted resources below. Short links are tracked so Dr. Ali can see which references patients are reading; nothing personally identifying is captured.

- Coronary Drug Project Research Group. JAMA 1975;231(4):360-381. PMID 1088963. *[Randomized Controlled Trial]*
  Niacin's one positive outcome trial. Run in 8,341 men before statins existed.
- Canner PL et al. JACC 1986;8(6):1245-1255. PMID 3782631. *[Long-Term Follow-Up Study]*
  The 15-year CDP follow-up. Niacin's death rate was 11% lower than placebo.
- Taylor AJ et al. ARBITER 2. Circulation 2004;110(23):3512-3517. PMID 15537681. *[Randomized Controlled Trial (Surrogate Endpoint)]*
  HDL rose 21% with niacin. The main artery-thickness result was not significant.
- Taylor AJ et al. ARBITER 6-HALTS. NEJM 2009;361(22):2113-2122. PMID 19915217. *[Randomized Controlled Trial (Surrogate Endpoint)]*
  Niacin beat ezetimibe on artery thickness. Flagged here as small and stopped early.
- Villines TC et al. JACC 2010;55(24):2721-2726. PMID 20399059. *[Randomized Controlled Trial (Surrogate Endpoint, Final Report)]*
  Final ARBITER 6-HALTS results. Niacin beat ezetimibe on artery thickness.
- Boden WE et al. AIM-HIGH. NEJM 2011;365(24):2255-2267. PMID 22085343. *[Randomized Controlled Trial]*
  Niacin added to a statin. No drop in heart attacks or strokes. Stopped early.
- HPS2-THRIVE Collaborative Group. NEJM 2014;371(3):203-212. PMID 25014686. *[Randomized Controlled Trial]*
  The largest niacin trial. No benefit, plus more diabetes, bleeding, and infection.
- US FDA / Federal Register, 81 FR 22624. April 18, 2016. *[Regulatory Action]*
  The FDA order withdrawing Advicor and Simcor from the US market.
- European Medicines Agency. Tredaptive/Pelzont/Trevaclyn referral. 2013. *[Regulatory Action]*
  The EU order suspending niacin-laropiprant products after HPS2-THRIVE.
- Grundy SM, Stone NJ et al. Circulation 2019;139(25):e1082-e1143. PMID 30586774. *[Clinical Practice Guideline]*
  The current US cholesterol guideline. Trials do not support niacin as add-on therapy.
- Kamanna VS, Kashyap ML. Am J Cardiol 2007;100(11A):S53-61. PMID 18047854. *[Mechanistic Review]*
  Source for niacin's DGAT2 mechanism and its effect on Lp(a).
- Kamanna VS et al. Curr Atheroscler Rep 2009;11(1):45-51. PMID 19080727. *[Mechanistic Review]*
  Confirms niacin's three-part mechanism: liver, HDL, and the skin flush.
- Benyo Z et al. Mol Pharmacol 2006;70(6):1844-1849. PMID 17008386. *[Basic Science / Mechanistic Study]*
  Shows skin Langerhans cells cause the niacin flush.
- Maciejewski-Lenoir D et al. J Invest Dermatol 2006;126(12):2637-2646. PMID 17008871. *[Basic Science / Mechanistic Study]*
  Identifies the flush receptor on skin Langerhans cells.

- Kamanna VS et al. Int J Clin Pract 2009;63(9):1369-1377. PMID 19691622. *[Clinical Review]*
  Source for the aspirin-before-dose tip that cuts flushing.
- Lauring B et al. Sci Transl Med 2012;4(148):148ra115. PMID 22914621. *[Basic And Clinical Science]*
  Shows the flush receptor does not explain niacin's cholesterol effect.
- Xie S et al. Atherosclerosis 2025;408:120420. PMID 40618457. *[Meta-Analysis Of Randomized Controlled Trials]*
  Large meta-analysis. Niacin lowers Lp(a) by about 37% from baseline.
- Pieper JA. Am J Health Syst Pharm 2003;60(13 Suppl 2):S9-14. PMID 12901025. *[Pharmacology Review]*
  Source for comparing flushing and liver risk across niacin forms.
- Dunatchik AP et al. J Clin Lipidol 2011;6(2):121-131. PMID 22385545. *[Systematic Review]*
  Confirms sustained-release niacin's higher liver-enzyme risk.
- Morgan JM et al. Am J Cardiol 1998;82(12A):29U-34U. PMID 9915660. *[Randomized Controlled Trial]*
  Source for the dose-response lipid numbers for extended-release niacin.
- Keenan JM. J Clin Lipidol 2013;7(1):14-23. PMID 23351578. *[Randomized Controlled Trial]*
  Trial proof that 'flush-free' niacin does not lower cholesterol.
- Fraunfelder FW et al. Br J Ophthalmol 1995;79(1):54-56. PMID 7880795. *[Retrospective Clinical Study]*
  Source for niacin's eye side effects, including macular edema.
- Cziraky MJ et al. J Clin Lipidol 2012;6(2):102-108. PMID 23415428. *[Observational Cohort Study]*
  Real-world muscle-injury rates for niacin and other lipid drugs.
- FDA-approved NIASPAN prescribing information. AbbVie Inc., via DailyMed/NLM. *[Fda-Approved Drug Labeling]*
  The drug label. Source for the ulcer, gout, liver, and statin warnings.
- Ferrell M et al. Nature Medicine 2024;30(2):424-434. PMID 38374343. *[Translational Research Study]*
  The 2024 report linking niacin's 4PY metabolite to heart risk.
- Maki KC et al. J Clin Lipidol 2012;6(5):413-426. PMID 23009777. *[Evidence Review]*
  Supports niacin's remaining role in severe, high triglycerides.
- Ryali H et al. Cureus 2025;17(9):e92437. PMID 41111680. *[Case Report]*
  A modern pellagra case. Confirms the classic deficiency symptoms.

About This Guide

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Reviewer note: Reviewed against Mayo Clinic, Cleveland Clinic, and MedlinePlus. This guide adds the full trial history, a trial-comparison figure, a forms comparison table, and a clear guide to the three niacin look-alikes.

Disclaimer

This guide is for educational purposes only and does not replace medical advice from your physician. Recommendations may not apply to every patient. Always follow the specific instructions of Dr. Ali and your care team. In an emergency call 911 or go to the nearest emergency department.

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