

Emergency Medicine Grand Rounds

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The Common Cold: Evidence-Based Treatment of Acute Rhinosinusitis

major cause of medical visits.^{4,7}

Complications

Almost a quarter of kids with a cold will get a middle ear infection. Pneumonia is common after a viral URI, and is often mixed viral and bacterial, especially in kids. Eighty percent of asthmatics get exacerbation with a cold. Some with a cold will go on to sinusitis; see below.

Cough

Colds are the #1 cause of acute cough.⁸ Over-the-counter cough medicines – including dextromethorphan (e.g., *Robitussin-DM, Delsym*) and guaifenesin (e.g., *Robitussin, Mucinex*) are useless.^{9,10} However, honey is much better than dextromethorphan for kids' cough.^{11,12} The researchers used buckwheat honey, which is rich and dark and my favorite. Use local honey, not ultra-filtered pollen-less honey smuggled in from China; the pollen is likely what helps cough. NSAIDs such as ibuprofen (e.g., *Motrin, Advil*) and naproxen (e.g., *Aleve*) help.¹³ An albuterol inhaler may help if wheezing, a wheezy cough, or a family history of asthma.¹⁴

Rhinorrhea/Nasal Congestion

First generation antihistamines such as diphenhydramine (*Benadryl*) or chlorpheniramine may help with the runny nose the first 2-3 days, though they make you sleepy; non-sedating second-generation antihistamines (*Claritin, Zyrtec, Allegra*) are useless.^{15,16}

Oral decongestants such as pseudoephedrine (e.g., *Sudafed*) are effective, but have major side effects and abuse potential.¹⁷ Nasal sprays, such as oxymetazoline (e.g., *Afrin*) are effective, with few side effects, and if used <10 days, there's no risk of "addiction" (rhinitis medicamentosa).^{17,18}

Ipratropium (*Atrovent*) nasal spray (Rx only) is mildly effective, but expensive.¹⁸ Steroid nasal sprays (e.g., *Flonase, Nasonex*) are ineffective for colds,¹⁹ but good for "real" sinusitis.²⁰⁻²²

Saline (salt water) spray that is isotonic (the same salt concentration as blood; e.g., *Ocean*) is effective,²³ and great for "sinusitis".^{24,25} Hypertonic (more salty) saline nasal is not useful.²⁶ Don't use a neti pot with tap water unless you want an amebic brain abscess. I recommend the sealed, high-pressure Ocean Sinus Irrigation.

Myalgia/Malaise

Many "colds" are actually mild influenza, and aspirin (ASA) may cause Reye's Syndrome (liver failure) with flu. Avoid ASA! Both ASA and acetaminophen (e.g., *Tylenol*) increase nasal stuffiness, and makes you sick 1-2 days longer.²⁷ Tylenol also makes asthma worse.²⁸ NSAIDs have less of this effect, and decrease malaise, myalgias **and cough**.²⁹ However, suppressing fever may make you sicker; fever helps fight infections.³⁰

Combination Cold Medications

Combination cold medications (e.g., *Theraflu, NyQuil, DayQuil*) include two or more of: acetaminophen (*Tylenol*); an antihistamine; a decongestant; or a cough suppressant. However, they are definitively useless for children under 12. They also kill infants under 2 years old when

It happens to us all. The common cold. It's not an "emergency," but people want help, preferably an instant cure.

Causes

Colds are "caused" by: rhinovirus (picornaviruses, >100 serotypes), coronavirus, adenovirus, coxsackievirus, echovirus, orthomyxovirus, paramyxovirus (parainfluenza), enterovirus, metapneumovirus, mild influenza, and respiratory syncytial virus (RSV), which is severe in kids but mild in adults. Still, the cause of ¼-½ of adult colds is unknown. A quarter of those "infected" with a cold virus don't even notice it! Colds with bacterial overgrowth (~20%) are more severe; the usual pathogens are *S. pneumoniae*, *H. influenzae*, or *M. catarrhalis*; but antibiotics don't help.¹

Winter is cold season, maybe from crowding, or from cold noses. Brief cold exposure doesn't cause colds,² but cold feet causes a cold in 10% within 4 days.³

Stress and allergic rhinitis make us more likely to catch cold, though exercise – except strenuous military PT – doesn't predispose, nor does diet or big tonsils.⁴ ICAM-1, the cell membrane receptor that rhinovirus uses to infect cells, increases with irritants like dust, pollen and tobacco smoke (including second-hand smoke), predisposing to colds.⁵

Epidemiology and Economics (US figures)

- 1 billion colds/yr
- Kids: every 6 weeks; once/month if in school/daycare⁵
- Adults: 2-4/yr, decreases with age
- 1.6 million (of 43.8 million) ED visits in 1998
- 22 million school days/yr lost
- >\$20 billion/year work loss (>1/3 caring for sick kids)
- We spend \$4 billion a year on OTC cold medications
- We spend \$400 million/year on Rx "cold" medications

Natural History/Symptoms

Onset is ~10 hours, and about 2-3 days to peak symptoms. It usually lasts 2-14 days, smokers 3 days longer.⁶

Symptoms depend more on you than the specific virus. Usually it starts with a **sore throat**, not impressive on exam, as well as **coryza**: red, swollen nasal mucosa (not pale and boggy like allergy) and clear nasal discharge. Later, there is **catarrh**: purulent yellow-green nasal discharge. Colored drainage at this stage has **no** correlation with bacterial infection.⁷ Adults get chills but no fever – actually a briefly **low** body temperature – but kids under 12 often get a fever. Poor appetite, malaise, and headache are common; half will get muscle aches (myalgias) but not as bad as with influenza. These may be from **cytokines**, which is why non-steroidal anti-inflammatory drugs (NSAIDs) like ibuprofen (*Motrin, Advil, Nuprin*) and naproxen (*Aleve*), which inhibit cytokines, help. Cough is universal, and the



Recommendations

1. Don't use combination cold medications, aspirin or acetaminophen (*Tylenol*).
2. Don't treat fever unless very high; use hot baths (or my favorite, an electric blanket) for muscle aches. Use a zap-in-the-micro-wave sinus mask or heat pack on the sinuses.
3. Use naproxen (*Aleve*, lasts longer) or ibuprofen (*Motrin, Advil, Nuprin*), not for fever, but for aches and cough.
4. Don't use over-the-counter or prescription cough medications, use honey and naproxen instead.
5. Use oxymetazoline (*Afrin*) nasal spray up to 10 days, for those > 2 years of age.
6. Use saline nasal spray (*Ocean Sinus Irrigation*) frequently. For infants, use a blue bulb syringe to suck out the nose afterwards.
7. Use zinc lozenges (*ZiCam*), which will decrease cold by two days and decrease symptoms.
8. If cold lasts > 10 days, still with yellow nasal discharge, fever, or sinus pain, consult a doctor for an antibiotic and a steroid nasal spray.

THE COST OF THE COMMON COLD & INFLUENZA

Work it out like this:
On an average, 1 day's work are lost a year by each worker by illness as a result of colds or influenza. The average worker's salary is £100 per year. The work of a worker is worth £100 per year.

If one third of all the men and women who lost these days were making tanks, one third bombers, and one third rifles:

3,000 TANKS
1,000 BOMBERS
1,000,000 RIFLES

That's the cost of the common cold and influenza. The year lost to prevent the spread of infection. Is having the germ in a bacteriostat when you cough or sneeze.

HELP TO KEEP THE NATION FIGHTING FIT

parents accidentally give the wrong dose.³¹ Cold medicine manufacturers have combined revenues of more than 4 billion dollars yearly and thus can afford many lobbyists; perhaps this explains why they are allowed to market useless medications to children 2-12. Canada does not allow marketing to kids under 6.³² Two-thirds of US homes have one or more combination cold meds,¹⁶ but even in adults, evidence for efficacy is scant and suspect. Given the side effects, it's best to avoid them.⁹

Zinc and Homeopathic Remedies

Zinc has been a research topic for many years, as it blocks the ICAM receptors that provide entry to cold viruses. But, the field has been clouded by snake-oil-ish unsubstantiated claims. Indeed, zinc is sold as a homeopathic remedy, despite the fact that it is actually a drug and sold in therapeutic and not homeopathic concentrations.

There is overwhelming evidence that true homeopathic preparations are just as good as distilled water. Homeopathic remedies *are* based on distilled water with a tiny bit of a pharmaceutical, which has been diluted over and over while being hit numerous times with a leather paddle, magically changing the distilled water, even though there is not a single molecule of the original ingredient left. True homeopathic remedies are harmless, though they may prevent users from seeking more effective remedies.³³

ZiCam zinc nasal spray was sold as a homeopathic remedy, and the FDA removed it from the shelves after hundreds permanently lost their sense of smell.³⁴ *ZiCam Nasal Spray* is now just expensive oxymetazoline (*Afrin*).

A meta-analysis (a pooling of scientific studies) holds that zinc syrup or lozenges, especially if you start within 24 hours – will reduce symptoms and shorten your cold by two days. Call it an “antiviral antibiotic.”³⁵

“Alternative” Therapies

Hot baths have been long recommended,³⁶ and as fever has antiviral effects,³⁰ may be beneficial, as may warmth on the sinuses though there are no cold-specific studies. Breathing warm, humidified air for 20 minutes helps in the UK and Israel, but not in the US.^{37,38} Most UK houses don't have central heat, which might mean colder noses.

Echinacea,³⁹ Vitamin C⁴⁰ and garlic⁴¹ are useless. Chicken soup improves nasal mucus drainage,⁴² but nobody studied canned soup vs. a Jewish mother's soup with matzoh balls.

Colds vs. “Sinusitis”

If you have 3-4 days of nasal congestion, and now your snout is yellow, green or purple, an antibiotic will not help. Really. True despite the 53% of people who think they need an antibiotic for a cold,^{43,44} and the thousands of doctors who prescribe antibiotics for colds.⁴⁴ I call a cold *acute viral rhinosinusitis* to acknowledge that yes, your sinuses are infected – but with a virus, not bacteria. Despite the fact that some bad colds have bacterial superinfection, any benefit of antibiotics is far outweighed by side effects, especially diarrhea.

“Sinusitis” (sinus opacification) shows on CT scans of almost everyone with a cold (87-90%) and 40% of those *without* a cold, so is useless for diagnosing “sinusitis”; X-ray is no better.⁴⁵⁻⁴⁷ Therefore, the diagnosis of “sinusitis” is clinical. But, nobody agrees which signs and symptoms should diagnose “sinusitis.”⁴⁸

Every cold is *viral* sinusitis, and some will have bacterial superinfection.⁴⁷ The question is: when will antibacterial antibiotics help? Though two studies have called this into question,^{22,49} the best current recommendation is that anyone with > 10 days of a “cold” still with purulent nasal discharge, or onset with *severe* symptoms or high fever for at least 3-4 consecutive days, or worsening after 5-6 days, may benefit from an antibiotic and steroid nasal spray.⁵⁰⁻⁵² Amoxicillin, Bactrim and Zithromax are ineffective, so antibiotics such as Augmentin, doxycycline, Levaquin are appropriate.^{49,52}

References

- Arroll B, Kenealy T. Antibiotics for the common cold and acute purulent rhinitis. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2005.
- Douglas RGJ, Lindgren KM, Couch RB. Exposure to cold environment and rhinovirus common cold. Failure to demonstrate effect. *N Engl J Med* 1968;279.
- Johnson C, Eccles R. Acute cooling of the feet and the onset of common cold symptoms. *Fam Pract* 2005;22:608-13.
- Heikkinen T, Jarvinen A. The common cold. *Lancet* 2003;361:51-9.
- Fleming DW, Cochi SL, Hightower AW, Broome CV. Childhood upper respiratory tract infections: to what degree is incidence affected by day-care attendance? *Pediatrics* 1987;79:55-60.
- Aranson MD, Weiss ST, Ben RL, Komaroff AL. Association between cigarette smoking and acute respiratory tract illness in young adults. *Jama* 1982;248:181-3.
- Eccles R. Understanding the symptoms of the common cold and influenza. *Lancet Infect Dis* 2005;5:718-25.
- Pratter MR. Cough and the common cold: ACCP evidence-based clinical practice guidelines. *Chest* 2006;129:725-45.
- Smith MB, Feldman W. Over-the-counter cold medications. A critical review of clinical trials between 1950 and 1991. *Jama* 1993;269:2258-63.
- Smith SM, Schroeder K, Fahey T. Over-the-counter (OTC) medications for acute cough in children and adults in ambulatory settings. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2008.
- Paul JM, Beiler J, McMonagle A, Shaffer ML, Duda L, Berlin CM, Jr. Effect of honey, dextromethorphan, and no treatment on nocturnal cough and sleep quality for coughing children and their parents. *Arch Pediatr Adolesc Med* 2007;161:1140-6.
- Warren MD, Pont SJ, Barkin SL, et al. The effect of honey on nocturnal cough and sleep quality for children and their parents. *Arch Pediatr Adolesc Med* 2007;161:1149-53.
- Sperber SJ, Hendley JO, Hayden FG, Riker DK, Sorrentino JV, Gwaltney JM, Jr. Effects of naproxen on experimental rhinovirus colds. A randomized, double-blind, controlled trial. *Annals of internal medicine* 1992;117:37-41.
- Smucny J, Becker LA, Glazier R. Beta2-agonists for acute bronchitis. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2006.
- De Sutter AIM, Lemiengre M, Campbell H. Antihistamines for the common cold. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2009.
- Moss SB. Treatment of the common cold. *Bmj* 1998;317:33-6.
- Taverner D, Latte GJ. Nasal decongestants for the common cold. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2009.
- Eccles R, Martensson K, Chen SC. Effects of intranasal xylometazoline, alone or in combination with ipratropium, in patients with common cold. *Curr Med Res Opin* 2010.
- Puhakka T, Makela MJ, Malmstrom K, et al. The common cold: effects of intranasal fluticasone propionate treatment. *J Allergy Clin Immunol* 1998;101:726-31.
- Intranasal steroids alone effective for acute uncomplicated sinusitis. *The Journal of family practice* 2006;55:190.
- Zalmanovici A, Yaphe J. Intranasal steroids for acute sinusitis. *Cochrane database of systematic reviews* (Online) 2009;CD005149.
- Williamson IG, Rumsby K, Bengt S, et al. Antibiotics and topical nasal steroid for treatment of acute maxillary sinusitis: a randomized controlled trial. *JAMA* 2007;298:2487-96.
- Slapak I, Skoupaj J, Strnad P, Hornik P. Efficacy of isotonic nasal wash (seawater) in the treatment and prevention of rhinitis in children. *Arch Otolaryngol Head Neck Surg* 2008;134:67-74.
- Bachmann G, Hommel G, Michel O. Effect of irrigation of the nose with isotonic salt solution on adult patients with chronic paranasal sinus disease. *Eur Arch Otorhinolaryngol* 2000;257:537-41.
- Harvey R, Hannan SA, Badia L, Scadding G. Nasal saline irrigations for the symptoms of chronic rhinosinusitis. *Cochrane database of systematic reviews* (Online) 2007;CD006394.
- Adam P, Stiffman M, Blake RL, Jr. A clinical trial of hypertonic saline nasal spray in subjects with the common cold or rhinosinusitis. *Arch Fam Med* 1998;7:39-43.
- Graham NM, Burrell CJ, Douglas RM, DeBelle P, Davies L. Adverse effects of aspirin, acetaminophen, and ibuprofen on immune function, viral shedding, and clinical status in rhinovirus-infected volunteers. *J Infect Dis* 1990;162:1277-82.
- McBride JT. The association of acetaminophen and asthma prevalence and severity. *Pediatrics* 2011;128:1181-5.
- Kim SY, Chang Y-J, Cho HM, Hwang Y-W, Moon YS. Non-steroidal anti-inflammatory drugs for the common cold. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2009.
- Kluger MJ, Kozak W, Conn CA, Leon LR, Soszynski D. The adaptive value of fever. *Infectious disease clinics of North America* 1996;10:1-20.
- Sharfstein JM, North M, Serwint JR. Over the counter but no longer under the radar—pediatric cough and cold medications. *N Engl J Med* 2007;357:2321-4.
- Shefrin AE, Goldman RD. Use of over-the-counter cough and cold medications in children. *Can Fam Physician* 2009;55:1081-3.
- Shang A, Huwiler-Muntener K, Nartey L, et al. Are the clinical effects of homeopathic placebo effects? Comparative study of placebo-controlled trials of homeopathy and allopathy. *Lancet* 2005;366:726-32.
- Jafek BW, Linschoten MR, Murrow BW. Anosmia after intranasal zinc gluconate use. *Am J Rhinol* 2004;18:137-41.
- Singh M, Das RR. Zinc for the common cold. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2011.
- Reimann HA. Viral infections of respiratory tract; their treatment and prevention. *J Am Med Assoc* 1946;132:487-93.
- Singh M, Singh M. Heated, humidified air for the common cold. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2011.
- Tyrrell D, Barrow I, Arthur J. Local hyperthermia benefits natural and experimental common colds. *Bmj* 1989;298:1280-3.
- Linde K, Barrett B, Bauer R, Melchart D, Woelkart K. Echinacea for preventing and treating the common cold. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2006.
- Hemila H, Chalker E, Douglas B. Vitamin C for preventing and treating the common cold. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2007.
- Lissiman E, Bhasale Alice L, Cohen M. Garlic for the common cold. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2009.
- Saketkoo K, Januszkiewicz A, Sackner MA. Effects of drinking hot water, cold water, and chicken soup on nasal mucus velocity and nasal airflow resistance. *Chest* 1978;74:408-10.
- Lee GM, Friedman JF, Ross-Degnan D, Hibberd PL, Goldmann DA. Misconceptions about colds and predictors of health service utilization. *Pediatrics* 2003;111:231-6.
- Mainous AG, 3rd, Hueston WJ, Clark JR. Antibiotics and upper respiratory infection: do some folks think there is a cure for the common cold. *The Journal of family practice* 1996;42:357-61.
- Schwartz RH, Pitkaranta A, Winther B. Computed tomography imaging of the maxillary and ethmoid sinuses in children with short-duration purulent rhinorrhea. *Otolaryngology—head and neck surgery : official journal of American Academy of Otolaryngology—Head and Neck Surgery* 2001;124:160-3.
- Gwaltney JM, Jr., Phillips CD, Miller RD, Riker DK. Computed tomographic study of the common cold. *The New England journal of medicine* 1994;330:25-30.
- Kaiser L, Lew D, Hirschel B, et al. Effects of antibiotic treatment in the subset of common-cold patients who have bacteria in nasopharyngeal secretions. *Lancet* 1996;347:1507-10.
- Lanza DC, Kennedy DW. Adult rhinosinusitis defined. *Otolaryngology—head and neck surgery : official journal of American Academy of Otolaryngology—Head and Neck Surgery* 1997;117:51-7.
- Garbutt JM, Banister C, Spitznagel E, Piccirillo JF. Amoxicillin for acute rhinosinusitis: a randomized controlled trial. *Jama* 2012;307:685-92.
- Benninger MS, Sedory Holzer SE, Lau J. Diagnosis and treatment of uncomplicated acute bacterial rhinosinusitis: summary of the Agency for Health Care Policy and Research evidence-based report. *Otolaryngology—head and neck surgery : official journal of American Academy of Otolaryngology—Head and Neck Surgery* 2000;122:1-7.
- Ahovuo-Saloranta A, Rautakorpi U-M, Borisenko OV, Liira H, Williams JTW, Makela M. Antibiotics for acute maxillary sinusitis. In: Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2008.
- Chow AW, Benninger MS, Brook I, et al. IDSA Clinical Practice Guidelines for Acute Bacterial Rhinosinusitis in Children and Adults. *Clin Infect Dis* 2012;54:e72-e112.

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