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Interventions to Improve Health Care Quality and Reduce Harm: Consolidated Items Relevant to Primary Care from the Choosing Wisely Campaign

This table is organized alphabetically by primary discipline. The sponsoring organizations are listed below each reccommendation.
This list includes recommendations as of July 31, 2016 and will be updated periodically as more recommendations are released in the future.

Topic area(s)	Recommendation	Rationale and comments	References	Source
Allergy and immunologic	Don't routinely do diagnostic testing in patients with chronic urticaria. *American Academy of Allergy, Asthma and Immunology*	In the overwhelming majority of patients with chronic urticaria, a definite etiology is not identified. Limited laboratory testing may be warranted to exclude underlying causes. Targeted laboratory testing based on clinical suspicion is appropriate. Routine extensive testing is neither cost-effective nor associated with improved clinical outcomes. Skin or serum-specific IgE testing for inhalants or foods is not indicated, unless there is a clear history implicating an allergen as a provoking or perpetuating factor for urticaria.	Wanderer AA, et al. The diagnosis and management of urticaria: a practice parameter. Ann Allergy Asthma Immunol. 2000;85:521-44. Tarbox JA, et al. Utility of routine laboratory testing in management of chronic urticaria/angioedema. Ann Allergy Asthma Immunol. 2011;107:239-43. Bernstein IL, et al. Allergy diagnostic testing: an updated practice parameter. Ann Allergy Asthma Immunol. 2008;100(3 suppl 3):S1-148. Kozel MM, et al. Laboratory tests and identified diagnoses in patients with physical and chronic urticaria and angioedema: A systematic review. J Am Acad Dermatol. 2003;48(3):409-16.	American Academy of Allergy, Asthma and Immunology guideline
Allergy and Immunologic	Don't perform food IgE testing without a history consistent with potential IgE-mediated food allergy. *American Academy of Allergy, Asthma & Immunology*	False or clinically irrelevant positive allergy tests for foods are frequent. Indiscriminate screening results in inappropriate avoidance of foods and wastes healthcare resources. IgE testing for specific foods must be driven by a history of signs or symptoms consistent with an IgE-mediated reaction after eating a particular food. Ordering IgE testing in individuals who do not have a history consistent with or suggestive for food allergy based on history frequently reveals positive tests that are unlikely to be clinically relevant. Testing, when done, should be limited to suspected foods. The diagnostic utility of IgE testing for specific foods is optimal when a history compatible with or suggestive for the diagnosis of food allergy is present. In the absence of a compatible or suggestive history, the pre-test probability for a diagnosis of food allergy is low and a positive skin or in vitro IgE test does	Bernstein IL, Li JT, Bernstein DI, Hamilton R, Spector SL, Tan R, Sicherer S, Golden DB, Khan DA, Nicklas RA, Portnoy JM, Blessing-Moore J, Cox L, Lang DM, Oppenheimer J, Randolph CC, Schuller DE, Tilles SA, Wallace DV, Levetin E, Weber R; American Academy of Allergy, Asthma and Immunology; American College of Allergy, Asthma and Immunology. Allergy diagnostic testing: an updated practice parameter. Ann Allergy Asthma Immunol. 2008 Mar;100(3 Suppl 3):S1–148. NIAID-Sponsored Expert Panel, Boyce JA, Assa'ad A, Burks AW, Jones SM, Sampson HA, Wood RA, Plaut M, Cooper SF, Fenton MJ, Arshad SH, Bahna SL, Beck LA, Byrd-Bredbenner C, Camargo CA Jr, Eichenfield L, Furuta GT, Hanifin JM, Jones C, Kraft M, Levy BD, Lieberman P, Luccioli S, McCall KM, Schneider LC, Simon RA, Simons FE, Teach SJ, Yawn BP, Schwaninger JM. Guidelines for the diagnosis and management of food allergy in the United States: report of the NIAID-sponsored expert panel. J Allergy Clin Immunol. 2010 Dec;126 (6 Suppl):S1–58.	Expert consensus

		not establish a diagnosis of food allergy. Skin testing or serum testing for specific-IgE to food antigens has excellent sensitivity and high negative predictive value, but has low specificity and low positive predictive value. Considering that 50 to 90% of presumed cases of food allergy do not reflect IgE-mediated (allergic) pathogenesis and may instead reflect food intolerance or symptoms not causally associated with food consumption, ordering panels of food tests leads to many incorrectly identified food allergies and inappropriate recommendations to avoid foods that are positive on testing.		
Allergy and Immunologic	Don't routinely order low- or iso-osmolar radiocontrast media or pretreat with corticosteroids and antihistamines for patients with a history of seafood allergy, who require radiocontrast media. *American Academy of Allergy, Asthma & Immunology*	Although the exact mechanism for contrast media reactions is unknown, there is no cause and effect connection with seafood allergy. Consequently there is no reason to use more expensive agents or pre-medication before using contrast media in patients with a history of seafood allergy. A prior history of anaphylaxis to contrast media is an indication to use low- or iso-osmolar agents and pretreat with corticosteroids and antihistamines. Patients with a history of seafood allergy are not at elevated risk for anaphylaxis from iodinated contrast media. Similarly, patients who have had anaphylaxis from contrast media should not be told that they are allergic to seafood. Patients with a history of seafood allergy who are labeled as being at greater risk for adverse reaction from contrast infusions experience considerable morbidity from unnecessary precautions, including but not limited to denying them indicated roentgenographic procedures and adverse effects from pretreatment with antihistamine and/or corticosteroid medications. Regardless of whether these patients truly have IgE-mediated allergies to seafood (crustacean), there is no evidence in the medical literature that indicates they are at elevated risk for anaphylaxis from contrast infusion compared	American Academy of Asthma, Allergy and Immunology. Food allergy: a practice parameter. Ann Allergy Asthma Immunol. 2006 Mar;96:S1–68. Lieberman P, Nicklas RA, Oppenheimer J, Kemp SF, Lang DM. The diagnosis and management of anaphylaxis practice parameter: 2010 update. J Allergy Clin Immunol. 2010 Aug 21;126(3):477–522. Solensky R, Khan DA. Drug allergy: an updated parameter. Ann Allergy Asthma Immunol. 2010 Oct;105(4):259–73. Sicherer S, Munoz-Furlong A, Sampson H. Prevalence of seafood allergy in the United States determined by a random telephone survey. J Allergy Clin Immunol. 2004;114:159–65. Greenberger P. Prophylaxis against repeated radio contrast media reaction in 857 cases. Arch Intern Med. 1985;145:2197–200. Sicherer SH. Risk of severe allergic reactions from the use of potassium iodide for radiation emergencies. J Allergy Clin Immunol. 2004;114:1395–7. Lang DM, Alpern MB, Visintainer PF, Smith ST. Elevated risk for anaphylactoid reaction from radiographic contrast media associated with both beta blocker exposure and cardiovascular disorders. Arch Intern Med. 1993;153:2033–40.	Expert consensus

		with the history-negative general population. In a random telephone survey of 5,529 households with a census of 14,948 individuals, seafood allergy was reported by 3.3% of survey respondents. According to current U.S. population estimates for 2013, this corresponds to 10,395,000 Americans. The mechanism for anaphylaxis to radio-iodinated contrast media relates to the physiochemical properties of these media and is unrelated to its iodine content. Further, although delayed-type hypersensitivity (allergic contact dermatitis) reactions to iodine have rarely been reported, IgE-mediated reactions to iodine have not, and neither type of reaction would be related to IgE-mediated shellfish allergy nor to contrast media reactions. Patients with a history of prior anaphylaxis to contrast media are at elevated risk for anaphylactic reaction with re-exposure to contrast media. Patients with asthma or cardiovascular disease, or who are taking beta blockers, are at increased risk for serious anaphylaxis from radiographic contrast media.		
Allergy and Immunologic	Don't perform screening panels for food allergies without previous consideration of medical history. *American Academy of Pediatrics*	Ordering screening panels (IgE tests) that test for a variety of food allergens without previous consideration of the medical history is not recommended. Sensitization (a positive test) without clinical allergy is common. For example, about 8% of the population tests positive to peanuts but only approximately 1% are truly allergic and exhibit symptoms upon ingestion. When symptoms suggest a food allergy, tests should be selected based on a careful medical history.	Sicherer SH, Wood RA; American Academy of Pediatrics Section on Allergy and Immunology. Allergy testing in childhood: using allergen-specific IgE tests. Pediatrics. 2012 Jan;129(1):193–7.	AAP guideline
Allergy and Immunologic **Emergency Medicine**	Don't rely on antihistamines as first-line treatment in severe allergic reactions.	Epinephrine is the first-line treatment for anaphylaxis. Data indicate that antihistamines are overused as the first-line treatment of anaphylaxis. By definition, anaphylaxis has cardiovascular and respiratory manifestations,	Lieberman P, Nicklas RA, Oppenheimer J, Kemp SF, Lang DM, Bernstein DI, Bernstein JA, Burks AW, Feldweg AM, Fink JN, Greenberger PA, Golden DB, James JM, Kemp SF, Ledford DK, Lieberman P, Sheffer AL, Bernstein DI, Blessing-Moore J, Cox L, Khan DA, Lang D, Nicklas RA, Oppenheimer J, Portnoy JM,	American Academy of Allergy, Asthma and Immunology

	American Academy of Allergy, Asthma & Immunology	which require treatment with epinephrine. Overuse of antihistamines, which do not treat cardiovascular or respiratory manifestations of anaphylaxis, can delay the effective first-line treatment with epinephrine. Epinephrine should be administered as soon as the diagnosis of anaphylaxis is suspected. Antihistamines are second-line supportive therapy for cutaneous non–life-threatening symptoms (hives), but do not replace epinephrine as the first-line treatment for anaphylaxis. Fatalities during anaphylaxis have been associated with delayed administration of epinephrine.	Randolph C, Schuller DE, Spector SL, Tilles S, Wallace D. The diagnosis and management of anaphylaxis practice parameter 2010 update. J Allergy Clin Immunol. 2010 Sep;126(3):477-80.e1–42. Sampson HA, Muñoz-Furlong A, Campbell RL, Adkinson NF Jr, Bock SA, Branum A, Brown SG, Camargo CA Jr, Cydulka R, Galli SJ, Gidudu J, Gruchalla RS, Harlor AD Jr, Hepner DL, Lewis LM, Lieberman PL, Metcalfe DD, O'Connor R, Muraro A, Rudman A, Schmitt C, Scherrer D, Simons FE, Thomas S, Wood JP, Decker WW. Second symposium on the definition and management of anaphylaxis: summary report – Second National Institute of Allergy and Infectious Diseases/ Food Allergy and Anaphylaxis Network symposium. J Allergy Clin Immunol. 2006 Feb;117(2):391–7. Kemp SF, Lockey RF, Simons FE; World Allergy Organization ad hoc Committee on Epinephrine in Anaphylaxis. Epinephrine the drug of choice for anaphylaxis. A statement of the World Allergy Organization. Allergy. 2008 Aug;63(8):1061–70. Cox L, Nelson H, Lockey R, Calabria C, Chacko T, Finegold I, Nelson M, Weber R, Bernstein DI, Blessing-Moore J, Khan DA, Lang DM, Nicklas RA, Oppenheimer J, Portnoy JM, Randolph C, Schuller DE, Spector SL, Tilles S, Wallace D. Allergen immunotherapy: a practice parameter third update. J Allergy Clin Immunol. 2011 Jan;127(1 Suppl):s1–55. Golden DB, Moffitt J, Nicklas RA, Freeman T, Graft DF, Reisman RE, Tracy JM, Bernstein D, Blessing-Moore J, Cox L, Khan DA, Lang DM, Oppenheimer J, Portnoy JM, Randolph C, Schuller DE, Spector SL, Tilles SA, Wallace D; Joint Task Force on Practice Parameters; American Academy of Allergy, Asthma & Immunology (AAAAI); American College of Allergy, Asthma & Immunology (ACAAI); Joint Council of Allergy, Asthma and Immunology. Stinging insect hypersensitivity: a practice parameter update 2011. J Allergy Clin Immunol. 2011 Apr; 127(4):852–4. Clark S, Long AA, Gaeta TJ, Camargo CC. Multicenter study of emergency department visits for insect sting allergies. J Allergy Clin Immunol. 2005;116:643–9.	guidelines
Allergy and immunologic	Don't routinely perform sinonasal imaging in patients with symptoms	History, physical examination, and allergy testing are the cornerstones of diagnosis of allergic rhinitis. The utility of imaging for	Seidman MD, Gurgel RK, Lin SY, Schwartz SR, Baroody FM, Bonner JR, Dawson DE, Dykewicz MS, Hackell JM, Han JK, Ishman SL, Krouse HJ, Malekzadeh S, Mims JW, Omole FS, Reddy WD,	Practice guideline

Otolaryn-gologic	limited to a primary diagnosis of allergic rhinitis alone. *American Academy of Otolaryngology — Head and Neck Surgery Foundation*	allergic rhinitis is unproven.	Wallace DV, Walsh SA, Warren BE, Wilson MN, Nnacheta LC. Clinical practice guideline: allergic rhinitis. Otolaryngol Head Neck Surg. 2015;152(1 Suppl):S1-S43.	

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Alternative medicine	Don't recommend chelation except for documented metal intoxication, which has been diagnosed using validated tests in appropriate biological samples. *American College of Medical Toxicology* *American Academy of Clinical Toxicology*	Chelation does not improve objective outcomes in autism, cardiovascular disease, or neurodegenerative conditions like Alzheimer's disease. Edetate disodium is not U.S. Food and Drug Administration–approved for any condition. Even when used for appropriately diagnosed metal intoxication, chelating drugs may have significant side effects, including dehydration, hypocalcemia, kidney injury, liver enzyme elevations, hypotension, allergic reactions, and essential mineral deficiencies. Inappropriate chelation, which may cost hundreds to thousands of dollars, risks these harms, as well as neurodevelopmental toxicity, teratogenicity, and death.	Nonstandard uses of chelation therapy. Med Lett Drugs Ther. 2010 Sep 20;52(1347):75-6. Kosnett MJ. Chelation for heavy metals (arsenic, lead, and mercury): protective or perilous? Clin Pharmacol Ther. 2010 Sep;88(3):412-5. Nissen SE. Concerns about reliability in the Trial to Assess Chelation Therapy (TACT). JAMA. 2013 Mar 27;309(12):1293-4. Risher JF, Amler SN. Mercury exposure: evaluation and intervention the inappropriate use of chelating agents in the diagnosis and treatment of putative mercury poisoning. Neurotoxicology. 2005 Aug;26(4):691-9. U.S. Food and Drug Administration. FDA warns marketers of unapproved 'chelation' drugs. FDA Consumer Health Information. 2010 October;1.	Expert consensus
Alternative medicine **Preventive medicine**	Don't use homeopathic medications, non-vitamin dietary supplements or herbal supplements as treatments for disease or preventive health measures. *American College of Medical Toxicology* *American Academy of Clinical Toxicology*	Alternative therapies are often assumed safe and effective just because they are "natural." There is a lack of stringent quality control of the ingredients present in many herbal and dietary supplements. Reliable evidence that these products are effective is often lacking, but substantial evidence exists that they may produce harm. Indirect health risks also occur when these products delay or replace more effective forms of treatment or when they compromise the efficacy of conventional medicines.	Woodward KN. The potential impact of the use of the homeopathic and herbal medicines on monitoring the safety of prescription products. Hum Exp Toxicol. 2005;24:219-33. Thompson E, Barron S, Spence D. A preliminary audit investigating remedy reactions including adverse events in routine homeopathic practice. Homeopathy. 2004;93:203-9. De Smet PA. Health risks of herbal remedies. Drug Saf. 1995;13:81-93. Farah MH, Edwards R, Lindquist M, Leon C, Shaw D. International monitoring of adverse health effects associated with herbal medicines. Pharmacoepidemiol Drug Saf. 2000;9(2):105-12. Drew AK, Myers SP. Safety issues in herbal medicine: implications for the health professions. Med J Aust. 1997;166:538-41.	Expert consensus

Topic area(s)	Recommendation	Rationale and comments	References	Source
Cardio-vascular	Don't perform stress cardiac imaging or advanced noninvasive imaging in the initial evaluation of patients without cardiac symptoms unless high-risk markers are present. *American College of Cardiology*	Asymptomatic, low-risk patients account for up to 45% of unnecessary "screening." Testing should be performed only when the following findings are present: diabetes in patients older than 40 years; peripheral arterial disease; or greater than 2% yearly risk of coronary heart disease events.	Hendel RC, et al. ACCF/ASNC/ACR/AHA/ASE/SCCT/ SCMR/SNM 2009 appropriate use criteria for cardiac radionuclide imaging. J Am Coll Cardiol. 2009;53:2201-29. Taylor AJ, et al. ACCF/SCCT/ACR/AHA/ASE/ASNC/ SCAI/SCMR 2010 appropriate use criteria for cardiac computed tomography. J Am Coll Cardiol. 2010;56:1864-94. Douglas PS, et al. ACCF/ASE/AHA/ASNC/HFSA/HRS/ SCAI/SCCM/SCCT/SCMR 2011 appropriate use criteria for echocardiography. J Am Coll Cardiol. 2011;57(9):1126-66. Hendel RC, et al. Role of radionuclide myocardial perfusion imaging for asymptomatic individuals. J Nucl Cardiol. 2011;18:3-15.	ACC/AHA guidelines
Cardio-vascular	Don't use coronary artery calcium scoring for patients with known CAD (including stents and bypass grafts). *Society of Cardiovascular Computed Tomography*	Coronary artery calcium scoring is used for evaluation of individuals without known CAD and offers limited incremental prognostic value for individuals with known CAD, such as those with stents and bypass grafts.	Budoff MJ, et al. Assessment of coronary artery disease by cardiac computed tomography. Circulation. 2006;114(16): 1761-91. Greenland P, et al. ACCF/AHA 2007 clinical expert consensus document on coronary artery calcium scoring by computed tomography in global cardiovascular risk assessment and in evaluation of patients with chest pain. J Amer Coll Cardiol. 2007;49(3):378-402.	ACC/AHA guidelines
Cardio-vascular	Avoid using stress echocardiograms on asymptomatic patients who meet "low-risk" scoring criteria for coronary disease. *American Society of Echocardiography*	Stress echocardiography is mostly used in symptomatic patients to assist in the diagnosis of obstructive CAD. There is very little information on using stress echocardiography in asymptomatic individuals for the purposes of cardiovascular risk assessment, as a stand-alone test or in addition to conventional risk factors.	Douglas PS, et al. ACCF/ASE/AHA/ASNC/HFSA/HRS/ SCAI/SCCM/SCCT/SCMR 2011 appropriate use criteria for echocardiography. J Am Soc Echocardiogr. 2011;24:229-67. Gibbons RJ, et al. ACC/AHA 2002 guideline update for the management of patients with chronic stable angina. 2002. http://www.cardiosource.org/~/media/Images/ACC/Science%20and%20Quality/Practice%20Guidelines/s/stable_clean.ashx Greenland P, et al. 2010 ACCF/AHA guideline for assessment of cardiovascular risk in asymptomatic adults. J Am Coll Cardiol. 2010;56:e50-103.	ACC/AHA guidelines
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Cardio-vascular	Avoid using stress echocardiograms on asymptomatic patients who meet "low-risk" scoring criteria for coronary disease. *American Society of Echocardiography*	Stress echocardiography is mostly used in symptomatic patients to assist in the diagnosis of obstructive CAD. There is very little information on using stress echocardiography in asymptomatic individuals for the purposes of cardiovascular risk assessment, as a stand-alone test or in addition to conventional risk factors.	Douglas PS, et al. ACCF/ASE/AHA/ASNC/HFSA/HRS/ SCAI/SCCM/SCCT/SCMR 2011 appropriate use criteria for echocardiography. J Am Soc Echocardiogr. 2011;24:229-67. Gibbons RJ, et al. ACC/AHA 2002 guideline update for the management of patients with chronic stable angina. 2002. http://www.cardiosource.org/~/media/Images/ACC/Science%20and%20Quality/Practice%20Guidelines/s/stable_clean.ashx Greenland P, et al. 2010 ACCF/AHA guideline for assessment of cardiovascular risk in asymptomatic adults. J Am Coll Cardiol. 2010;56:e50-103.	ACC/AHA guidelines
Cardio-vascular	Don't repeat echocardiograms in stable, asymptomatic patients with a murmur/click, where a previous exam revealed no significant pathology. *American Society of Echocardiography*	Repeat imaging to address the same question, when no pathology has been previously found and there has been no clinical change in the patient's condition, is not indicated.	Douglas PS, et al. ACCF/ASE/AHA/ASNC/HFSA/HRS/ SCAI/SCCM/SCCT/SCMR 2011 appropriate use criteria for echocardiography. J Am Soc Echocardiogr. 2011;24:229-67.	ACC/AHA guideline
Cardio-vascular	Don't order follow-up or serial echocardiograms for surveillance after a finding of trace valvular regurgitation on an initial echocardiogram. *American Society of Echocardiography*	Trace mitral, tricuspid, and pulmonic regurgitation can be detected in 70% to 90% of normal individuals and has no adverse clinical implications. The clinical significance of a small amount of aortic regurgitation with an otherwise normal echocardiographic study is unknown.	Douglas PS, et al. ACCF/ASE/AHA/ASNC/HFSA/HRS/ SCAI/SCCM/SCCT/SCMR 2011 appropriate use criteria for echocardiography. J Am Soc Echocardiogr. 2011;24:229-67. Bonow RO, et al. 2008 focused update incorporated into the ACC/AHA 2006 guidelines for the management of patients with valvular heart disease. J Am Coll Cardiol. 2008;52:e1-142.	ACC/AHA guidelines
Cardio-vascular	Avoid transesophageal echocardiography to detect cardiac sources of embolization if a source has been identified and patient management will not change. *American Society of*	Tests whose results will not alter management should not be ordered. Protocol-driven testing can be useful if it serves as a reminder not to omit a test or procedure, but should always be individualized to the particular patient. While transesophageal echocardiography is safe, even the small degree of risk associated with a procedure is not justified if there is no expected clinical benefit.	Douglas PS, et al. ACCF/ASE/AHA/ASNC/HFSA/HRS/ SCAI/SCCM/SCCT/SCMR 2011 appropriate use criteria for echocardiography. J Am Soc Echocardiogr. 2011;24:229-67.	ACC/AHA guideline

	Echocardiography			
Cardio-vascular	Don't order continuous telemetry monitoring outside of the intensive care unit without using a protocol that governs continuation. *Society of Hospital Medicine (Adult)*	Telemetric monitoring is of limited utility or measurable benefit in low-risk cardiac chest pain patients with normal electrocardiogram. Published guidelines provide clear indications for the use of telemetric monitoring in patients, which are contingent upon frequency, severity, duration, and conditions under which the symptoms occur. Inappropriate use of telemetric monitoring is likely to increase cost of care and produce false positives potentially resulting in errors in patient management.	Drew BJ, et al. Practice standards for electrocardiographic monitoring in hospital settings. Circulation. 2004;110:2721-46. Crawford MH, et al. ACC/AHA guidelines for ambulatory electrocardiography. Circulation. 1999;100:886-93. Snider A, et al. Is telemetry monitoring necessary in low-risk suspected acute chest pain syndromes? Chest. 2002;122:517-23. Marshaleen N, et al. Is telemetry overused? Is it as helpful as thought? Cleve Clin J Med. 2009;368-72. Adams HP Jr, et al. Guidelines for the early management of adults with ischemic stroke. Stroke. 2007;38(5):1655-711.	ACC/AHA guidelines
Cardio-vascular	Don't perform routine annual stress testing after coronary artery revascularization. *Society of Nuclear Medicine and Molecular Imaging*	Routine annual stress testing in patients without symptoms does not usually change management. This practice may lead to unnecessary testing without any proven impact on patient management.	Hendel RC, et al. ACCF/ASNC/ACR/AHA/ASE/SCCT/ SCMR/SNM 2009 appropriate use criteria for cardiac radionuclide imaging. J Am Coll Cardiol. 2009;53:2201-29.	ACC/AHA/ACR guideline
Cardio-vascular	Don't perform stress cardiac imaging or coronary angiography in patients without cardiac symptoms unless high-risk markers are present. *American Society of Nuclear Cardiology*	Asymptomatic, low-risk patients account for up to 45% of inappropriate stress testing. Testing should be performed only when the following findings are present: diabetes in patients older than 40 years, peripheral arterial disease, and greater than 2% yearly coronary heart disease event rate.	Hendel RC, Berman DS, Di Carli MF, Heidenreich PA, Henkin RE, Pellikka PA, Pohost GM, Williams KA. ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 appropriate use criteria for cardiac radionuclide imaging: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the American Society of Nuclear Cardiology, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the Society of Cardiovascular Computed Tomography, the Society for Cardiovascular Magnetic Resonance, and the Society of Nuclear Medicine. J Am Coll Cardiol. 2009;53:2201-29. Hendel RC, Abbott BG, Bateman TM, et al. Role of radionuclide myocardial perfusion imaging for asymptomatic individuals. J Nucl Cardiol. 2011;18:3-15.	ACC/AHA guideline

Cardio-vascular	Don't perform cardiac imaging for patients who are at low risk. *American Society of Nuclear Cardiology*	Chest pain patients at low risk of cardiac death and myocardial infarction (based on history, physical exam, electrocardiograms, and cardiac biomarkers) do not merit stress radionuclide myocardial perfusion imaging or stress echocardiography as an initial testing strategy if they have a normal electrocardiogram (without baseline ST-abnormalities, left ventricular hypertrophy, pre-excitation, bundle branch block, intraventricular conduction delay, paced rhythm or on digoxin therapy) and are able to exercise.	Hendel RC, Berman DS, Di Carli MF, Heidenreich PA, Henkin RE, Pellikka PA, Pohost GM, Williams KA. ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 appropriate use criteria for cardiac radionuclide imaging: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the American Society of Nuclear Cardiology, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the Society of Cardiovascular Computed Tomography, the Society for Cardiovascular Magnetic Resonance, and the Society of Nuclear Medicine. J Am Coll Cardiol. 2009;53:2201-29. Taylor AJ, Cerqueira M, Hodgson JM, Mark D, Min J, O'Gara P, Rubin GD. ACCF/SCCT/ACR/AHA/ASE/ASNC/SCAI/SCMR 2010 appropriate use criteria for cardiac computed tomography: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the Society of Cardiovascular Computed Tomography, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the American Society of Nuclear Cardiology, the Society for Cardiovascular Angiography and Interventions, and the Society for Cardiovascular Magnetic Resonance. J Am Coll Cardiol. 2010;56:1864-94. Anderson JL, Adams CD, Antman EM, Bridges CR, Califf RM, Casey DE Jr, Chavey WE II, Fesmire FM, Hochman JS, Levin TN, Lincoff AM, Peterson ED, Theroux P, Wenger NK, Wright RS. ACC/AHA 2007 guidelines for the management of patients with unstable angina/non-ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines for the Management of Patients with Unstable Angina/Non-ST-Elevation Myocardial Infarction): developed in collaboration with the American College of Emergency Physicians, American College of Physicians, Society for Academic Emergency Medicine, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. J Am Coll Cardiol. 2007;50:e1-157.	ACC/AHA guidelines

Cardio-vascular	Use methods to reduce radiation exposure in cardiac imaging, whenever possible, including not performing such tests when limited benefits are likely. *American Society of Nuclear Cardiology*	The key step to reduce or eliminate radiation exposure is appropriate selection of any test or procedure for a specific person, in keeping with medical society recommendations, such as appropriate use criteria. Health care providers should incorporate new methodologies in cardiac imaging to reduce patient exposure to radiation while maintaining high-quality test results.	Hendel RC, Berman DS, Di Carli MF, Heidenreich PA, Henkin RE, Pellikka PA, Pohost GM, Williams KA. ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 appropriate use criteria for cardiac radionuclide imaging: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the American Society of Nuclear Cardiology, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the Society of Cardiovascular Computed Tomography, the Society for Cardiovascular Magnetic Resonance, and the Society of Nuclear Medicine. J Am Coll Cardiol. 2009;53:2201-29. Taylor AJ, Cerqueira M, Hodgson JM, Mark D, Min J, O'Gara P, Rubin GD. ACCF/SCCT/ACR/AHA/ASE/ASNC/SCAI/SCMR 2010 appropriate use criteria for cardiac computed tomography: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the Society of Cardiovascular Computed Tomography, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the American Society of Nuclear Cardiology, the Society for Cardiovascular Angiography and Interventions, and the Society for Cardiovascular Magnetic Resonance. J Am Coll Cardiol. 2010;56:1864-94. Cerqueira MD, Allman KC, Ficaro EP, Hansen CL, Nichols KJ, Thompson RC, Van Decker WA, Yakovlevitch M. ASNC information statement: Recommendations for reducing radiation exposure in myocardial perfusion imaging. J Nucl Cardiol. 2010;17:709-18. Douglas PS, Carr JJ, Cerqueira MD, Cummings JE, Gerber TC, Mukherjee D, Taylor AJ. Developing an action plan for patient radiation safety in adult cardiovascular medicine: proceedings from the Duke University Clinical Research Institute/American College of Cardiology Foundation/American Heart Association Think Tank held on February 28, 2011. J Am Coll Cardiol. 2012;59:In Press. (Published online March 22, 2012.)	ACC/AHA guidelines
Cardio-vascular	Don't perform stress cardiovascular magnetic resonance in the initial evaluation of chest pain patients with low pretest probability	There are lower cost stress tests available for the initial evaluation of low-risk chest pain patients, particularly when they have a normal electrocardiogram and can exercise. Stress cardiovascular magnetic resonance can be valuable in evaluating intermediate-risk	Hendel RC, Patel MR, Kramer CM, Poon M, Hendel RC, Carr JC, Gerstad NA, Gillam LD, Hodgson JM, Kim RJ, Kramer CM, Lesser JR, Martin ET, Messer JV, Redberg RF, Rubin GD, Rumsfeld JS, Taylor AJ, Weigold WG, Woodard PK, Brindis RG, Hendel RC, Douglas PS, Peterson ED, Wolk MJ, Allen JM, Patel MR. ACCF/ACR/SCCT/SCMR/ASNC/NASCI/SCAI/SIR 2006	ACR Appropriateness Criteria

	of CAD. *Society for Cardiovascular Magnetic Resonance*	patients with abnormal electrocardiograms or who cannot exercise, or when initial test results are equivocal.	appropriateness criteria for cardiac computed tomography and cardiac magnetic resonance imaging. J Am Coll Cardiol. 2006 Oct 3;48(7):1475–97. American College of Radiology; Society of Cardiovascular Computed Tomography; Society for Cardiovascular Magnetic Resonance; American Society of Nuclear Cardiology; North American Society for Cardiac Imaging; Society for Cardiovascular Angiography and Interventions; Society of Interventional Radiology. ACCF/ACR/SCCT/SCMR/ASNC/NASCI/SCAI/SIR 2006 appropriateness criteria for cardiac computed tomography and cardiac magnetic resonance imaging. J Am Coll Radiol. 2006 Oct;3(10):751–71. Gibbons RJ, Balady GJ, Bricker JT, Chaitman BR, Fletcher GF, Froelicher VF, Mark DB, McCallister BD, Mooss AN, O'Reilly MG, Winters WL, Gibbons RJ, Antman EM, Alpert JS, Faxon DP, Fuster V, Gregoratos G, Hiratzka LF, Jacobs AK, Russell RO, Smith SC. ACC/AHA 2002 guideline update for exercise testing: summary article. J Am Coll Cardiol. 2002 Oct 16;40(8):1531–40. Gibbons RJ, Abrams J, Chatterjee K, Daley J, Deedwania PC, Douglas JS, Ferguson TB Jr, Fihn SD, Fraker TD Jr, Gardin JM, O'Rourke RA, Pasternak RC, Williams SV, Gibbons RJ, Alpert JS, Antman EM, Hiratzka LF, Fuster V, Faxon DP, Gregoratos G, Jacobs AK, Smith SC Jr. ACC/AHA 2002 guideline update for the management of patients with chronic stable angina-summary article. Circulation. 2003 Jan 7;107(1):149–58.	
Cardio-vascular **Geriatric**	Don't routinely prescribe lipid-lowering medications in individuals with a limited life expectancy. *American Medical Directors Association*	There is no evidence that hypercholesterolemia, or low high-density lipoprotein cholesterol is an important risk factor for all-cause mortality, coronary heart disease mortality, or hospitalization for myocardial infarction or unstable angina in persons older than 70 years. In fact, studies show that elderly patients with the lowest cholesterol have the highest mortality after adjusting other risk factors. In addition, a less favorable risk-benefit ratio may be seen for patients older than 85, where benefits may be more diminished and risks from statin drugs more increased (cognitive impairment, falls, neuropathy and muscle damage).	Dalleur O, Spinewine A, Henrard S, Losseau C, Speybroeck N, Boland B. Inappropriate prescribing and related hospital admissions in frail older persons according to the STOPP and START criteria. Drugs Aging. 2012 Oct;29(10):829-37. Schiattarella GG, Perrino C, Magliulo F, Ilardi F, Serino F, Trimarco V, Izzo R, Amato B, Terranova C, Cardin F, Militello C, Leosco D, Trimarco B, Esposito G. Statins and the elderly: recent evidence and current indications. Aging Clin Exp Res. 2012 Jun;24(3 Suppl):47-55. Maraldi C, Lattanzio F, Onder G, Gallerani M, Bustacchini S, De Tommaso G, Volpato S. Variability in the prescription of cardiovascular medications in older patients: correlates and potential explanations. Drugs Aging. 2009 Dec;26 Suppl 1:41-51. Schatz IJ, Masaki K, Yano K, Chen R, Rodriguez BL, Curb JD. Cholesterol and all-cause mortality in elderly people from the Honolulu Heart Program: a cohort study. Lancet. 2001 Aug	Expert consensus

			4;358(9279):351-5. Weverling-Rijnsburger AW, Blauw GJ, Lagaay AM, Knook DL, Meinders AE, Westendorp RG. Total cholesterol and risk of mortality in the oldest old. Lancet. 1997 Oct 18;3 (9085):1119-23. Krumholz HM, Seeman TE, Merrill SS, Mendes de Leon CF, Vaccarino V, Silverman DI, Tsukahara R, Ostfeld AM, Berkman LF. Lack of association between cholesterol and coronary heart disease mortality and morbidity and all-cause mortality in persons older than 70 years. JAMA. 1994 Nov 2;272(17):1335-40.	
Cardio-vascular **Geriatric**	Don't leave an implantable cardioverter-defibrillator activated when it is inconsistent with the patient/family goals of care. *American Academy of Hospice and Palliative Medicine*	In about a quarter of patients with implantable cardioverter-defibrillators, the defibrillator fires within weeks preceding death. For patients with advanced irreversible diseases, defibrillator shocks rarely prevent death, may be painful to patients, and are distressing to caregivers/family members. Currently there are no formal practice protocols to address deactivation; fewer than 10% of hospices have official policies. Advance care planning discussions should include the option of deactivating the implantable cardioverter-defibrillator when it no longer supports the patient's goals.	Berger JT. The ethics of deactivating implanted cardioverter defibrillators. Ann Intern Med. 2005;142:631-34. Goldstein N, et al. Brief communication: management of implantable cardioverter-defibrillators in hospice: A nationwide survey. Ann Intern Med. 2010;152(5):296-9. Goldstein NE, et al. Management of implantable cardioverter defibrillators in end-of-life care. Ann Intern Med. 2004;141(11):835-8. Russo, J. Deactivation of ICDs at the end of life: A systematic review of clinical practices and provider and patient attitudes. Am J Nurs. 2011;111(10):26-35.	Expert consensus
Cardio-vascular **Preventive medicine**	Don't order annual electrocardiography or any other cardiac screening for asymptomatic, low-risk patients. *American Academy of Family Physicians* *American College of Physicians*	There is little evidence that detection of coronary artery stenosis improves health outcomes in asymptomatic patients at low risk of coronary heart disease. False-positive test results are likely to lead to harm through unnecessary invasive procedures, overtreatment, and misdiagnosis. Potential harms of routine annual screening exceed the potential benefit.	U.S. Preventive Services Task Force. Screening for coronary heart disease with electrocardiography. http://www.uspreventiveservicestaskforce.org/uspstf/uspsacad.htm.	USPSTF
Cardio-vascular **Preventive medicine**	Don't order coronary artery calcium scoring for screening purposes on low-risk asymptomatic individuals except for	Net reclassification of risk by coronary artery calcium scoring, when added to clinical risk scoring, is least effective in low-risk individuals.	Budoff MJ, et al. Assessment of coronary artery disease by cardiac computed tomography. Circulation. 2006;114(16): 1761-91. Shaw LJ, et al. Prognostic value of cardiac risk factors and coronary artery calcium screening for all-cause mortality. Radiology. 2003;228(3):826–33.	AHA guideline

	those with a family history of premature CAD. *Society of Cardiovascular Computed Tomography*			
Cardio-vascular **Preventive medicine**	Don't routinely order coronary CT angiography for screening asymptomatic individuals. *Society of Cardiovascular Computed Tomography*	Coronary CT angiography findings of CAD stenosis severity rarely offer incremental discrimination over coronary artery calcium scoring in asymptomatic individuals.	Choi EK, et al. Coronary computed tomography angiography as a screening tool for the detection of occult coronary artery disease in asymptomatic individuals. J Am Coll Cardiol. 2008;52:357-65. Taylor AJ, et al. ACCF/SCCT/ACR/AHA/ASE/ASNC/ NASCI/SCAI/SCMR 2010 appropriate use criteria for cardiac computed tomography. J Amer Coll Cardiol. 2010;56(22): 1864-94. USPSTF. Using nontraditional risk factors in coronary heart disease assessment. October 2009. http://www.uspreventive servicestaskforce.org/uspstf/uspscoronaryhd.htm.	USPSTF, ACC/AHA guideline
Cardio-vascular **Emergency Medicine**	Don't perform stress cardiovascular magnetic resonance in patients with acute chest pain and high probability of CAD. *Society for Cardiovascular Magnetic Resonance*	Stress testing can increase risk and delay therapy in patients with acute chest pain and markers of high risk, such as ST segment elevation and/or positive cardiac enzymes. After initial evaluation and therapy, non-stress cardiovascular magnetic resonance may aid in diagnosing ischemic or nonischemic myocardial injury.	Hendel RC, Patel MR, Kramer CM, Poon M, Hendel RC, Carr JC, Gerstad NA, Gillam LD, Hodgson JM, Kim RJ, Kramer CM, Lesser JR, Martin ET, Messer JV, Redberg RF, Rubin GD, Rumsfeld JS, Taylor AJ, Weigold WG, Woodard PK, Brindis RG, Hendel RC, Douglas PS, Peterson ED, Wolk MJ, Allen JM, Patel MR. ACCF/ACR/SCCT/SCMR/ASNC/NASCI/SCAI/SIR 2006 appropriateness criteria for cardiac computed tomography and cardiac magnetic resonance imaging. J Am Coll Cardiol. 2006 Oct 3;48(7):1475–97. American College of Radiology; Society of Cardiovascular Computed Tomography; Society for Cardiovascular Magnetic Resonance; American Society of Nuclear Cardiology; North American Society for Cardiac Imaging; Society for Cardiovascular Angiography and Interventions; Society of Interventional Radiology. ACCF/ACR/SCCT/SCMR/ASNC/NASCI/SCAI/SIR 2006 appropriateness criteria for cardiac computed tomography and cardiac magnetic resonance imaging. J Am Coll Radiol. 2006 Oct;3(10):751–71. Anderson JL, Adams CD, Antman EM, Bridges CR, Califf RM, Casey DE Jr, Chavey WE 2nd, Fesmire FM, Hochman JS, Levin TN, Lincoff AM, Peterson ED, Theroux P, Wenger NK, Wright RS, Smith SC Jr. 2011 ACCF/AHA Focused Update Incorporated Into the ACC/AHA 2007 Guidelines for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction.	ACR Appropriateness Criteria

			Circulation. 2011 May 10;123(18):e426–579.	
Cardio-vascular	Don't perform coronary cardiovascular magnetic resonance in the initial evaluation of asymptomatic patients. *Society for Cardiovascular Magnetic Resonance*	Coronary cardiovascular magnetic resonance has not been well established for the evaluation of coronary atherosclerosis. Coronary cardiovascular magnetic resonance is primarily indicated for detecting and characterizing anomalous coronary arteries.	Hendel RC, Patel MR, Kramer CM, Poon M, Hendel RC, Carr JC, Gerstad NA, Gillam LD, Hodgson JM, Kim RJ, Kramer CM, Lesser JR, Martin ET, Messer JV, Redberg RF, Rubin GD, Rumsfeld JS, Taylor AJ, Weigold WG, Woodard PK, Brindis RG, Hendel RC, Douglas PS, Peterson ED, Wolk MJ, Allen JM, Patel MR. ACCF/ACR/SCCT/SCMR/ASNC/NASCI/SCAI/SIR 2006 appropriateness criteria for cardiac computed tomography and cardiac magnetic resonance imaging. J Am Coll Cardiol. 2006 Oct 3;48(7):1475–97. American College of Radiology; Society of Cardiovascular Computed Tomography; Society for Cardiovascular Magnetic Resonance; American Society of Nuclear Cardiology; North American Society for Cardiac Imaging; Society for Cardiovascular Angiography and Interventions; Society of Interventional Radiology. ACCF/ACR/SCCT/SCMR/ASNC/NASCI/SCAI/SIR 2006 appropriateness criteria for cardiac computed tomography and cardiac magnetic resonance imaging. J Am Coll Radiol. 2006 Oct;3(10):751–71. Pennell DJ, Sechtem UP, Higgins CB, Manning WJ, Pohost GM, Rademakers FE, van Rossum AC, Shaw LJ, Yucel EK. Clinical indications for cardiovascular magnetic resonance (CMR): Consensus Panel report. J Cardiovasc Magn Reson. 2004;6(4):727–65.	ACR Appropriateness Criteria
Cardio-vascular **Surgical**	Don't use interventions (including surgical bypass, angiogram, angioplasty or stent) as a first line of treatment for most patients with intermittent claudication. *Society for Vascular Surgery (SVS)*	A trial of smoking cessation, risk factor modification, diet and exercise, as well as pharmacologic treatment should be attempted before any procedures. When indicated, the type of intervention (surgery or angioplasty) depends on several factors. Intermittent claudication can vary due to several factors. The lifetime incidence of amputation in a patient with claudication is less than 5% with appropriate risk factor modification. Procedures for claudication are usually not limb-saving, but, rather, lifestyle-improving. However, interventions are not without risks, including worsening the patient's perfusion, and should be reserved until a trial of conservative management has been attempted. Many people will actually realize an increase in	Adam DJ, Beard JD, Cleveland T, Bell J, Bradbury AW, Forbes JF, Fowkes FG, Gillepsie I, Ruckley CV, Raab G, Storkey H; BASIL trial participants. Bypass versus angioplasty in severe ischaemia of the leg (BASIL): multicentre, randomised controlled trial. Lancet. 2005;366(9501):1925-34. Norgren L, Hiatt WR, Dormandy JA, Nehler MR, Harris KA, Fowkes FG; TASC II Working Group. Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II). J Vasc Surg. 2007;45 Suppl S:S5-67.	Expert consensus

		their walking distance and pain threshold with exercise therapy. In cases in which the claudication limits a person's ability to carry out normal daily functions, it is appropriate to intervene. Depending on the characteristics of the occlusive process, and patient comorbidities, the best option for treatment may be either surgical or endovascular.		
Cardio-vascular	Don't test for myoglobin or creatine kinase MB in the diagnosis of acute myocardial infarction. Instead, use troponin I or T. *American Society for Clinical Pathology*	Unlike creatine kinase MB and myoglobin, the release of troponin I or T is specific to cardiac injury. Troponin is released before creatine kinase MB and appears in the blood as early as, if not earlier than, myoglobin after acute myocardial infarction. Approximately 30% of patients experiencing chest discomfort at rest with a normal creatine kinase MB will be diagnosed with acute myocardial infarction when evaluated using troponins. Single-point troponin measurements equate to infarct size for the determination of the acute myocardial infarction severity. Accordingly, there is much support for relying solely on troponin and discontinuing the use of creatine kinase MB and other markers.	Thygesen K, Alpert JS, White HD; Joint ESC/ACCF/AHA/WHF Task Force for the Redefinition of Myocardial Infarction, Jaffe AS, Apple FS, Galvani M, Katus HA, Newby LK, Ravkilde J, Chaitman B, Clemmensen PM, Dellborg M, Hod H, Porela P, Underwood R, Bax JJ, Beller GA, Bonow R, Van der Wall EE, Bassand JP, Wijns W, Ferguson TB, Steg PG, Uretsky BF, Williams DO, Armstrong PW, Antman EM, Fox KA, Hamm CW, Ohman EM, Simoons ML, Poole-Wilson PA, Gurfinkel EP, Lopez-Sendon JL, Pais P, Mendis S, Zhu JR, Wallentin LC, Fernández-Avilés F, Fox KM, Parkhomenko AN, Priori SG, Tendera M, Voipio-Pulkki LM, Vahanian A, Camm AJ, De Caterina R, Dean V, Dickstein K, Filippatos G, Funck-Brentano C, Hellemans I, Kristensen SD, McGregor K, Sechtem U, Silber S, Tendera M, Widimsky P, Zamorano JL, Morais J, Brener S, Harrington R, Morrow D, Lim M, Martinez-Rios MA, Steinhubl S, Levine GN, Gibler WB, Goff D, Tubaro M, Dudek D, Al-Attar N. Universal definition of myocardial infarction. Circulation. 2007 Nov 27;116(22):2634-53. Eggers KM, Oldgren J, Nordenskjöld A, Lindahl B. Diagnostic value of serial measurement of cardiac markers in patients with chest pain: limited value of adding myoglobin to troponin I for exclusion of myocardial infarction. Am Heart J. 2004;148(4):574-81. Macrae AR, Kavsak PA, Lustig V, Bhargava R, Vandersluis R, Palomaki GE, Yerna MJ, Jaffe AS. Assessing the requirement for the 6-hour interval between specimens in the American Heart Association Classification of Myocardial Infarction in Epidemiology and Clinical Research Studies. Clin Chem. 2006;52(5):812-8. Kavsak PA, Macrae AR, Newman AM, Lustig V, Palomaki GE, Ko DT, Tu JV, Jaffe AS. Effects of contemporary troponin assay sensitivity on the utility of the early markers myoglobin and CKMB isoforms in evaluating patients with possible acute myocardial	Expert consensus

			infarction. Clin Chem Acta. 2007;380(1-2):213-6. Saenger AK, Jaffe AS. Requiem for a heavyweight: the demise of the creatine kinase-MB. Circulation. 2008;118(21):2200-6. Reichlin T. Hochholzer W, Bassetti S, Steuer S, Stelzig C, Hartwiger S, Biedert S, Schaub N, Buerge C, Potocki M, Noveanu M, Breidthardt T, Twerenbold R, Winkler K, Bingisser R, Mueller C. Early diagnosis of myocardial infarction with sensitive cardiac troponin assays. N Engl J Med. 2009;361(9):858-67.	
Cardio-vascular	Don't initiate antihypertensive treatment in individuals ≥ 60 years of age for systolic blood pressure < 150 mm Hg or diastolic blood pressure < 90 mm Hg. *The Society for Post-Acute and Long-Term Care Medicine*	There is strong evidence for the treatment of hypertension in older adults. Achieving a goal systolic blood pressure of 150 mm Hg reduces stroke incidence, all-cause mortality, and heart failure. Target systolic and diastolic blood pressure levels should be set cautiously, however, as data do not suggest benefit in treating more aggressively to a goal systolic blood pressure of < 140 mm Hg in the general population ≥ 60 years of age. Furthermore, moderate- or high-intensity treatment of hypertension has been associated with an increased risk of serious fall injury in older adults.	Beckett NS, Peters R, Fletcher AE, Staessen JA, Liu L, Dumitrascu D, Stoyanovsky V, Antikainen RL, Nikitin Y, Anderson C, Belhani A, Forette F, Rajkumar C, Thijs L, Banya W, Bulpitt CJ; HYVET Study Group. Treatment of hypertension in patients 80 years of age or older. N Engl J Med. 2008 May 1; 358(18):1887-98. James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, Lackland DT, LeFevre ML, MacKenzie TD, Ogedegbe O, Smith SC Jr, Svetkey LP, Taler SJ, Townsend RR, Wright JT Jr, Narva AS, Ortiz E. 2014 evidence-based guideline for the management of high blood pressure in adults. JAMA. 2014 Feb 5;311(5):507-20. Muntner P, Bowling CB, Shimbo D. Systolic blood pressure goals to reduce cardiovascular disease among older adults. Am J Med Sci. 2014 Aug;348(2):129-34. Tinetti ME, Han L, Lee DSH, McAvay GJ, Peduzzi P, Gross CP, Zhou B, Lin H. Antihypertensive medications and serious fall injuries in a nationally representative sample of older adults. JAMA Intern Med. 2014 Apr;174(4):588-95.	The Eighth Joint National Committee guideline

Topic area(s)	Recommendation	Rationale and comments	References	Source
Dermatologic	Don't prescribe oral antifungal therapy for suspected nail fungus without confirmation of fungal infection. *American Academy of Dermatology*	About half of nails with suspected fungus do not have a fungal infection. Because other nail conditions, such as nail dystrophies, may look similar in appearance, it is important to ensure accurate diagnosis of nail disease before beginning treatment. By confirming a fungal infection, patients are not inappropriately at risk for the side effects of antifungal therapy, and nail disease is correctly treated.	Roberts DT, Taylor WD, Boyle J; British Association of Dermatologists. Guidelines for treatment of onychomycosis. Br J Dermatol. 2003 Mar;148(3):402-10. Mehregan DR, Gee SL. The cost effectiveness of testing for onychomycosis versus empiric treatment of onychodystrophies with oral antifungal agents. Cutis. 1999 Dec;64(6):407-10.	Expert consensus
Dermatologic	Don't use oral antibiotics for treatment	The presence of high numbers of the *Staphylococcus aureus* (staph) bacteria on the	Bath-Hextall JF, Birnie AJ, Ravenscroft JC, Williams JC. Interventions to reduce Staphylococcus aureus in the management of	Cochrane Database of

Allergy and immunologic	of atopic dermatitis unless there is clinical evidence of infection. *American Academy of Dermatology*	skin of children and adults with atopic dermatitis is common. It is widely believed that staph bacteria may play a role in causing skin inflammation, but the routine use of oral antibiotic therapy to decrease the amount of bacteria on the skin has not been definitively shown to reduce the signs, symptoms (e.g., redness, itch), or severity of atopic dermatitis. In addition, if oral antibiotics are used when there is not an infection, it may lead to the development of antibiotic resistance. The use of oral antibiotics also can cause side effects, including hypersensitivity reactions, including exaggerated immune responses such as allergic reactions. Although it can be difficult to determine the presence of a skin infection in atopic dermatitis patients, oral antibiotics should only be used to treat patients with evidence of bacterial infection in conjunction with other standard and appropriate treatments for atopic dermatitis.	atopic eczema: an updated Cochrane review. Br J Dermatol. 2010;163:12-26.	Systematic Reviews
Dermatologic **Infectious disease**	Don't use antibiotic therapy for stasis dermatitis of lower extremities. *Infectious Diseases Society of America*	Stasis dermatitis is commonly treated with antibiotic therapy, which may be a result of misdiagnosis or lack of awareness of the pathophysiology of the disease. The standard of care for the treatment of stasis dermatitis affecting lower extremities is a combination of leg elevation and compression. Elevation of the affected area accelerates improvements by promoting gravity drainage of edema and inflammatory substances. The routine use of oral antibiotics does not improve healing rates and may result in unnecessary hospitalization, increased health care costs, and potential for patient harm.	Stevens DL, Bisno AL, Chambers HF, Dellinger EP, Goldstein EJ, Gorbach SL, Hirschmann JV, Kaplan SL, Montoya JG, Wade JC. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the infectious diseases society of America. Clin Infect Dis. 2014;59(2):147-59. Collins L, Seraj S. Diagnosis and treatment of venous ulcers. Am Fam Physician. 2010;81(8):989-96.	Infectious Diseases Society of America guideline

Topic area(s)	Recommendation	Rationale and comments	References	Source
Emergency medicine **Surgical**	Don't do CT for evaluation of suspected appendicitis in children until after ultrasound	Although CT is accurate in the evaluation of suspected appendicitis in the pediatric population, ultrasound is nearly as good in experienced hands. Since ultrasound will	Wan MJ, et al. Acute appendicitis in young children: cost-effectiveness of US versus CT in diagnosis-a Markov decision analytic model. Radiology. 2009;250:378-86. Doria AS, et al. US or CT for diagnosis of appendicitis in children? A	ACR Appropriateness Criteria

Pediatric	has been considered as an option. *American College of Radiology*	reduce radiation exposure, ultrasound is the preferred initial consideration for imaging examination in children. If the results of the ultrasound exam are equivocal, it may be followed by CT. This approach is cost-effective, reduces potential radiation risks, and has excellent accuracy, with reported sensitivity and specificity of 94%.	meta-analysis. Radiology. 2006;241:83-94. Garcia K, et al. Suspected appendicitis in children: diagnostic importance of normal abdominopelvic CT findings with nonvisualized appendix. Radiology. 2009;250:531-7. Krishnamoorthi R, et al. Effectiveness of a staged US and CT protocol for the diagnosis of pediatric appendicitis: reducing radiation exposure in the age of ALARA. Radiology. 2011;259:231-9. American College of Radiology. ACR Appropriateness Criteria: right lower quadrant pain/suspected appendicitis. http://www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria/pdf/ExpertPanelonGastrointestinalImaging/RightLowerQuadrantPainDoc12.aspx. Frush DP, et al. Imaging of acute appendicitis in children: EU versus U.S. or US versus CT? A North American perspective. Pediatr Radiolo. 2009;39(5):500-5.	
Emergency medicine **Cardiovascular**	Don't use coronary CT angiography in high-risk emergency department patients presenting with acute chest pain. NOTE*: Risk defined by the Thrombolysis In Myocardial Infarction risk score for unstable angina/acute coronary syndromes.* *Society of Cardiovascular Computed Tomography*	To date, RCTs evaluating use of coronary CT angiography for individuals presenting with acute chest pain in the emergency department have been limited to low- or low-intermediate–risk individuals.	Goldstein JA, et al. The CT-STAT (Coronary Computed Tomographic Angiography for Systematic Triage of Acute Chest Pain Patients to Treatment) trial. J Amer Coll Cardiol. 2011;58(14):1414-22. Hoffmann U, et al. Coronary CT angiography versus standard evaluation in acute chest pain. N Engl J Med. 2012;367(4):299-308. Litt HI, et al. CT angiography for s afe discharge of patients with possible acute coronary syndromes. N Engl J Med. 2012;366(15):1393-403.	RCTs
Emergency medicine	Avoid the routine use of "whole-body" diagnostic CT scanning in patients with minor or single system trauma. *American College of*	Aggressive use of "whole-body" CT scanning improves early diagnosis of injury and may even positively impact survival in polytrauma patients. However, the significance of radiation exposure as well as costs associated with these studies must be considered, especially in patients with low energy mechanisms of injury and absent physical examination findings	Huber-Wagner S, Lefering R, Qvick LM, Körner M, Kay MV, Pfeifer KJ, Reiser M, Mutschler W, Kanz KG; Working Group on Polytrauma of the German Trauma Society. Effect of whole-body CT during trauma resuscitation on survival: a retrospective, multicentre study. Lancet. 2009 Apr 25;373(9673):1455-61. Stengel D, Ottersbach C, Matthes G, Weigeldt M, Grundei S, Rademacher G, Tittel A, Mutze S, Ekkernkamp A, Frank M, Schmucker U, Seifert J. Accuracy of single-pass whole-body	Expert consensus

	Surgeons	consistent with major trauma.	computed tomography for detection of injuries in patients with blunt major trauma. CMAJ. 2012 May 15;184(8):869-76. Ahmadinia K, Smucker JB, Nash CL, Vallier HA. Radiation exposure has increased in trauma patients over time. J Trauma. 2012 Feb;72(2):410-5. Winslow JE, Hinshaw JW, Hughes MJ, Williams RC, Bozeman WP. Quantitative assessment of diagnostic radiation doses in adult blunt trauma patients. Ann Emerg Med. 2008 Aug;52(2):93-7.	
Emergency medicine **Pediatric** **Surgical**	Don't do CT for the evaluation of suspected appendicitis in children until after ultrasound has been considered as an option. *American College of Surgeons*	Although CT is accurate in the evaluation of suspected appendicitis in the pediatric population, ultrasound is the preferred initial consideration for imaging examination in children. If the results of the ultrasound exam are equivocal, it may be followed by CT. This approach is cost-effective, reduces potential radiation risks and has excellent accuracy, with reported sensitivity and specificity of 94% in experienced hands. Recognizing that expertise may vary, strategies including improving diagnostic expertise in community-based ultrasound and the development of evidence-based clinical decision rules are realistic goals in improving diagnosis without the use of CT scan.	Wan MJ, Krahn M, Ungar WJ, Caku E, Sung L, Medina LS, Doria AS. Acute appendicitis in young children: cost-effectiveness of US versus CT in diagnosis-a Markov decision analytic model. Radiology. 2009;250:378-86. Doria AS, Moineddin R, Kellenberger CJ, Epelman M, Beyene J, Schuh S, Babyn PS, Dick PT. US or CT for diagnosis of appendicitis in children? A meta-analysis. Radiology. 2006;241:83-94. Garcia K, Hernanz-Schulman M, Bennett DL, Morrow SE, Yu C, Kan JH. Suspected appendicitis in children: diagnostic importance of normal abdominopelvic CT findings with nonvisualized appendix. Radiology. 2009;250:531-7. Krishnamoorthi R, Ramarajan N, Wang NE, Newman B, Rubesova E, Mueller CM, Barth RA. Effectiveness of a staged US and CT protocol for the diagnosis of pediatric appendicitis: reducing radiation exposure in the age of ALARA. Radiology. 2011;259:231-9. Rosen MP, Ding A, Blake MA, Baker ME, Cash BD, Fidler JL, Grant TH, Greene FL, Jones B, Katz DS, Lalani T, Miller FH, Small WC, Spottswood S, Sudakoff GS, Tulchinsky M, Warshauer DM, Yee J, Coley BD, Expert Panel on Gastrointestinal Imaging. ACR Appropriateness Criteria® right lower quadrant pain -- suspected appendicitis. [Internet]. Reston (VA): American College of Radiology (ACR); 2010. 7 p. Frush DP, Frush KS, Oldham KT. Imaging of acute appendicitis in children: EU versus US or US versus CT? A North American perspective. Pediatr Radiolol. 2009;39(5):500-5. Saito JM, Yan Y, Evashwick TW, Warner BW, Tarr PI. Use and accuracy of diagnostic imaging by hospital type in pediatric appendicitis. Pediatrics. 2013;131(1):e37-44. Kharbanda AB, Stevenson MD, Macias CG, Sinclair K, Dudley NC, Bennett J, Bajaj L, Mittal MK, Huang C, Bachur RG, Dayan PS, and for the Pediatric Emergency Medicine Collaborative Research	ACR Appropriateness Criteria

			Committee of the American Academy of Pediatrics. Interrater reliability of clinical findings in children with possible appendicitis. Pediatrics. 2012;129(4):695-700.	
Emergency medicine	Avoid CT scans of the head in emergency department patients with minor head injury who are at low risk based on validated decision rules. *American College of Emergency Physicians*	Minor head injury is a common reason for visiting an emergency department. The majority of minor head injuries do not lead to injuries such as skull fractures or bleeding in the brain that need to be diagnosed by a CT scan. As CT scans expose patients to ionizing radiation, increasing patients' lifetime risk of cancer, they should only be performed on patients at risk for significant injuries. Physicians can safely identify patients with minor head injury in whom it is safe to not perform an immediate head CT by performing a thorough history and physical examination following evidence-based guidelines. This approach has been proven safe and effective at reducing the use of CT scans in large clinical trials. In children, clinical observation in the emergency department is recommended for some patients with minor head injury prior to deciding whether to perform a CT scan.	Jagoda AS, Bazarian JJ, Bruns JJ, Jr, Cantrill SV, Gean AD, Howard PK, Ghajar J, Riggio S, Wright DW, Wears RL, Bakshy A, Burgess P, Wald MM, Whitson RR; American College of Emergency Physicians; Centers for Disease Control and Prevention. Clinical policy: neuroimaging and decision-making in adult mild traumatic brain injury in the acute setting. Ann Emerg Med. 2008 Dec;52(6):714-48. Stiell IG, Clement CM, Rowe BH, Schull MJ, Brison R, Cass D, Eisenhauer MA, McKnight RD, Bandiera G, Holroyd B, Lee JS, Dreyer J, Worthington JR, Reardon M, Greenberg G, Lesiuk H,MacPhail I, Wells GA. Comparison of the Canadian CT head rule and the New Orleans criteria in patients with minor head injury. JAMA. 2005 Sep 28;294(12):1511-8. Haydel MJ, Preston CA, Mills TJ, Luber S, Blaudeau E, DeBlieux PM. Indications for computed tomography in patients with minor head injury. N Engl J Med. 2000 Jul 13;343(2):100-5. Smits M, Dippel DWJ, de Haan GG, Dekker HM, Vos PE, Kool DR, Nederkoorn PJ, Hofman PA, Twijnstra A, Tanghe HL, Hunink MG. External validation of the Canadian CT head rule and the New Orleans criteria for CT scanning in patients with minor head injury. JAMA. 2005 Sep 28;294(12):1519-25.	ACEP/Centers for Disease Control and Prevention guideline
Emergency medicine **Urologic** **Infectious disease**	Avoid placing indwelling urinary catheters in the emergency department for either urine output monitoring in stable patients who can void, or for patient or staff convenience. *American College of Emergency Physicians*	Indwelling urinary catheters are placed in patients in the emergency department to assist when patients cannot urinate, to monitor urine output, or for patient comfort. Catheter-associated urinary tract infection is the most common hospital-acquired infection in the U.S., and can be prevented by reducing the use of indwelling urinary catheters. Emergency physicians and nurses should discuss the need for a urinary catheter with a patient and/or their caregivers, as sometimes such catheters can be avoided. Emergency physicians can reduce the use of indwelling urinary catheters by following the Centers for Disease Control and Prevention's evidence-based guidelines for the use of urinary catheters. Indications for a	Umscheid CA, Mitchell MD, Doshi JA, Agarwal R, Williams K, Brennan PJ. Estimating the proportion of healthcare-associated infections that are reasonably preventable and the related mortality and costs. Infect Control Hosp Epidemiol. 2011 Feb;32:101-14. Lo E, Nicolle L, Classen D, Arias KM, Podgorny K, Anderson DJ, Burstin H, Calfee DP, Coffin SE, Dubberke ER, Fraser V, Gerding DN, Griffin FA, Gross P, Kaye KS, Klompas M, Marschall J,Mermel LA, Pegues DA, Perl TM, Saint S, Salgado CD, Weinstein RA, Wise R, Yokoe DS. Strategies to prevent catheter-associated urinary tract infections in acute care hospitals. Infect Control Hosp Epidemiol. 2008 Oct;29:S41-50. Munasinghe RL, Yazdani H, Siddique M, Hafeez W. Appropriateness of use of indwelling urinary catheters in patients admitted to the medical service. Infect Control Hosp Epidemiol. 2001 Oct;22:647-9. Hazelett SE, Tsai M, Gareri M, Allen K. The association between	Expert consensus

		catheter may include: output monitoring for critically ill patients, relief of urinary obstruction, at the time of surgery and end-of-life care. When possible, alternatives to indwelling urinary catheters should be used.	indwelling urinary catheter use in the elderly and urinary tract infection in acute care. BMC Geriatr. 2006 Oct 12;6:15. Gardam MA, Amihod B, Orenstein P, Consolacion N, Miller MA. Overutilization of indwelling urinary catheters and the development of nosocomial urinary tract infections. Clin Perform Qual Health Care. 1998 Jul-Sep;6:99-102. Gokula RR, Hickner JA, Smith MA. Inappropriate use of urinary catheters in elderly patients at a midwestern community teaching hospital. Am J Infect Control. 2004;32:196-9. Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA; Healthcare Infection Control Practices Advisory Committee (HICPAC). Guideline for prevention of catheter-associated urinary tract infections 2009. Atlanta (GA): HICPAC; 2009. 67 p. Scott RA, Oman KS, Makic MB, Fink RM, Hulett TM, Braaten JS, Severyn F, Wald HL. Reducing indwelling urinary catheter use in the emergency department. A successful quality-improvement initiative. J Emerg Nurs. 2013 Mar 7. pii: S0099-1767(12)00344–3. [Epub ahead of print]	
Emergency medicine	Don't delay engaging available palliative and hospice care services in the emergency department for patients likely to benefit. *American College of Emergency Physicians*	Palliative care is medical care that provides comfort and relief of symptoms for patients who have chronic and/or incurable diseases. Hospice care is palliative care for those patients in the final few months of life. Emergency physicians should engage patients who present to the emergency department with chronic or terminal illnesses, and their families, in conversations about palliative care and hospice services. Early referral from the emergency department to hospice and palliative care services can benefit select patients resulting in both improved quality and quantity of life.	DeVader TE, DeVader SR, Jeanmonod R. Reducing cost at the end of life by initiating transfer to inpatient hospice in the emergency department. Ann Emerg Med. 2012;60(4s):S73. Kenen J. We can't save you: how to tell emergency room patients that they're dying. Slate [Internet]. 2010 Aug 4 [cited 2013 Sep 4]. http://www.slate.com/id/2262769/. Quest TE, Marco CA, Derse AR. Hospice and palliative medicine: new subspecialty, new opportunities. Ann Emerg Med. 2009;54:94-102. Smith AK, McCarthy E, Weber E, Cenzer IS, Boscardin J, Fisher J, Covinsky K. Half of older Americans seen in emergency department in last month of life; most admitted to hospital, and many die there. Health Aff. 2012 Jun 31:1277-85.	Expert consensus
Emergency medicine	Avoid performing plain x-rays in instances of facial trauma. *American Society of Plastic Surgeons*	Evidence currently indicates that maxillofacial CT is available in most trauma centers and is the most sensitive method for detecting fractures in instances of facial trauma. Evidence also indicates that the use of plain x-rays does not improve quality of care, causes unnecessary radiation exposure, and leads to substantial increase in costs.	Sitzman TJ, et al. Clinical criteria for obtaining maxillofacial computed tomographic scans in trauma patients. Plast Reconstr Surg. 2011 Mar;127(3):1270–8. Stacey DH, Doyle JF, Mount DL, Snyder MC, Gutowski KA. Management of mandible fractures. Plast Reconstr Surg. 2006 Mar;117(3):48e–60e.	Expert consensus

		Use of plain x-rays for diagnosis and treatment is helpful in instances of dental and/or isolated mandibular injury or trauma.		
Emergency medicine **Neurologic** **Pediatric**	Don't routinely obtain CT scanning of children with mild head injuries. *American Association of Neurological Surgeons* and *Congress of Neurological Surgeons*	A mild traumatic brain injury is a temporary loss of neurologic function resulting from a blunt blow to the head or an acceleration/deceleration injury. There are predictors that a more severe injury has occurred and CT scanning may be appropriate. In patients younger than age two, a persistent altered mental status, non-frontal scalp hematoma, loss of consciousness for five seconds or more, severe injury mechanism, palpable skull fracture, or not acting normally according to the parent may be signs of a more serious injury. In patients older than two, prolonged abnormal mental status, any loss of consciousness, history of vomiting, severe injury mechanism, clinical signs of basilar skull fracture, or severe headache may also necessitate CT imaging. Any patient with a traumatic injury to the head that has any neurologic deficits should also be imaged if no other cause can be determined.	Kuppermann N, et al. Identification of children at very low risk of clinically important brain injuries after head trauma: a prospective cohort study. Lancet. 2009 Oct 3;374(9696):1160–70.	Prospective cohort study

Topic area(s)	Recommendation	Rationale and comments	References	Source
Endocrinologic **Geriatric**	Don't medicate to achieve tight glycemic control in older adults. Moderate control is generally better. *American Geriatrics Society*	There is no evidence that using medications to achieve tight glycemic control in older adults with type 2 diabetes is beneficial. Among nonolder adults, except for reductions in myocardial infarction and mortality with metformin, using medications to achieve glycated hemoglobin levels less than 7% is associated with harms, including higher mortality rates. Given the long time frame to achieve theorized microvascular benefits of tight control, glycemic goals should reflect patient goals, health status, and life expectancy.	ACCORD Study Group. Effects of intensive glucose lowering in type 2 diabetes. N Engl J Med. 2008;258(24):2545-59. ACCORD Study Group. Long-term effects of intensive glucose lowering on cardiovascular outcomes. N Engl J Med. 2011;364(9):818-28. Duckworth W, et al. Glucose control and vascular complications in veterans with type 2 diabetes. N Engl J Med. 2009;360(2):129-39. ADVANCE Collaborative Group, et al. Intensive blood glucose control and vascular outcomes in patients with type 2 diabetes. N Engl J Med. 2008;358:2560-72. UK Prospective Diabetes Study Group. Effect of intensive blood-glucose control with metformin on complications in overweight patients with type 2 diabetes. Lancet. 1998;352: 854-65. Montori VM, et al. Glycemic control in type 2 diabetes: time for an	RCTs

			evidence-based about-face? Ann Intern Med. 2009; 150(11):803-8. [Erratum: Ann Intern Med. 2009;151(2): 144]. Finucane T. "Tight control" in geriatrics: the emperor wears a thong. J Am Geriatr Soc. 2012;60:1571-5.	
Endocrinologic	Don't use nuclear medicine thyroid scans to evaluate thyroid nodules in patients with normal thyroid gland function. *Society of Nuclear Medicine and Molecular Imaging*	Nuclear medicine thyroid scanning does not conclusively determine whether thyroid nodules are benign or malignant. Cold nodules on thyroid scans will still require biopsy. Nuclear medicine thyroid scans are useful to evaluate the functional status of thyroid nodules in patients who are hyperthyroid.	Welker MJ, et al. Thyroid nodules. Am Fam Physician. 2003;67(3):559-67. American Thyroid Association Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer, et al. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. Thyroid. 2009;19(11):1167-214. Lee JC, et al. Thyroid scans. Aust Fam Physician. 2012;41(8):586.	Expert consensus
Endocrinologic **Geriatric**	Don't use sliding scale insulin for long-term diabetes management for individuals residing in the nursing home. *American Medical Directors Association*	SSI is a reactive way of treating hyperglycemia after it has occurred rather than preventing it. Good evidence exists that SSI is neither effective in meeting the body's insulin needs nor is it efficient in the long-term care setting. Use of SSI leads to greater patient discomfort and increased nursing time because patients' blood glucose levels are usually monitored more frequently than may be necessary and more insulin injections may be given. With SSI regimens, patients may be at risk from prolonged periods of hyperglycemia. In addition, the risk of hypoglycemia is a significant concern because insulin may be administered without regard to meal intake. Basal insulin, or basal plus rapid-acting insulin with one or more meals (often called basal/bolus insulin therapy) most closely mimics normal physiologic insulin production and controls blood glucose more effectively.	Sue Kirkman M, Briscoe VJ, Clark N, Florez H, Haas LB, Halter JB, Huang ES, Korytkowski MT, Munshi MN, Odegard PS, Pratley RE, Swift CS. Consensus Development Conference on Diabetes and Older Adults. Diabetes in older adults: a consensus report. J Am Geriatr Soc. 2012 Dec;60(12):2342-56. American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2012 Apr;60(4):616-31. Haq J. Insulin sliding scare, does it exist in the nursing home. JAMDA. 2010 Mar;11(3):B14. Hirsch IB. Sliding scale insulin—time to stop sliding. JAMA. 2009;301(2):213-214. American Medical Directors Association. Diabetes management in the long-term care setting clinical practice guideline. Columbia, Md.: AMDA 2008, revised 2010. Pandya N, Thompson S, Sambamoorthi U. The prevalence and persistence of sliding scale insulin use among newly admitted elderly nursing home residents with diabetes mellitus. J Am Med Dir Assoc. 2008 Nov;9(9):663-9. Umpierrez GE, Palacio A, Smiley D. Sliding scale insulin use: myth or insanity? Am J Med. 2007;120(7):563-67. Boyle P, Childs B. A roadmap for improving diabetes management in long-term care communities. Available from: http://www.med-iq.com/index.cfm?fuseaction=courses.overview&cID=591.	Expert consensus

			Golightly LK, Jones MA, Hamamura DH, Stolpman NM, McDermott MT. Management of diabetes mellitus in hospitalized patients: efficiency and effectiveness of sliding-scale insulin therapy. Pharmacotherapy. 2006;26(10):1421-32. Queale WS, Seidler AJ, Brancati FL. Glycemic control and sliding scale insulin use in medical inpatients with diabetes mellitus. Arch Intern Med. 1997;157(5):545-52.	
Endocrinologic	Don't recommend daily home finger glucose testing in patients with type 2 diabetes mellitus not using insulin. *Society of General Internal Medicine*	Self-monitoring of blood glucose is an integral part of patient self-management in maintaining safe and target-driven glucose control in type 1 diabetes. However, there is no benefit to daily finger glucose testing in patients with type 2 diabetes mellitus who are not on insulin or medications associated with hypoglycemia, and there is negative economic impact and potential negative clinical impact of daily glucose testing. Self-monitoring of blood glucose should be reserved for patients during the titration of their medication doses or during periods of changes in patients' diet and exercise routines.	American Diabetes Association. Standards of medical care in diabetes. Diabetes Care. 2013;36 Suppl 1:S11-66. Karter AJ, Parker MM, Moffet HH, Spence MM, Chan J, Ettner SL, Selby JV. Longitudinal study of new and prevalent use of self-monitoring of blood glucose. Diabetes Care. 2006;29:1757-63. Harris MI. Frequency of blood glucose monitoring in relation to glycemic control in patients with type 2 diabetes. Diabetes Care. 2001;24:979-82. Malanda UL, Welschen LMC, Riphagen II, Dekker JM, Nijpels G, Bot SDM. Self-monitoring of blood glucose in patients with type 2 diabetes mellitus who are not using insulin. Cochrane Database of Systematic Reviews. 2012;1:1-88. O'Kane MJ, Bunting B, Copeland M, Coates VE; ESMON study group. Efficacy of self-monitoring of blood glucose in patients with newly diagnosed type 2 diabetes (ESMON study): randomised controlled trial. BMJ. 2008;336:1174-7. Peel E, Douglas M, Lawton J. Self-monitoring of blood glucose in type 2 diabetes: longitudinal qualitative study of patients' perspectives. BMJ. 2007;335:493-8. Cameron C, Coyle D, Ur E, Klarenback S. Cost-effectiveness of self-monitoring of blood glucose in patients with type 2 diabetes mellitus managed without insulin. CMAJ. 2010;182(1):28-34.	Cochrane Database of Systematic Reviews
Endocrinologic	Avoid routine multiple daily self-glucose monitoring in adults with stable type 2 diabetes on agents that do not cause hypoglycemia. *The Endocrine Society*	Once target control is achieved and the results of self-monitoring become quite predictable, there is little gained in most individuals from repeatedly confirming. There are many exceptions, such as for acute illness, when new medications are added, when weight fluctuates significantly, when A1C targets drift off course and in individuals who need monitoring to maintain targets. Self-monitoring is beneficial as long as one is learning and adjusting therapy	Davidson MB, Castellanos M, Kain D, Duran P. The effect of self monitoring of blood glucose concentrations on glycated hemoglobin levels in diabetic patients not taking insulin: a blinded, randomized trial. Am J Med. 2005;118:422-5. Farmer A, Wade A, Goyder E, Yudkin P, French D, Craven A, Holman Rury, Kinmonth AL, Neil A. Impact of self monitoring of blood glucose in the management of patients with non-insulin treated diabetes: open parallel group randomized trial. BMJ. 2007;335:132-40. O'Kane MJ, Bunting B, Copeland M, Coates VE; ESMON study	RCTs

	American Association of Clinical Endocrinologists	based on the result of the monitoring.	group. Efficacy of self monitoring of blood glucose in patients with newly diagnosed type 2 diabetes (ESMON study): randomized controlled trial. BMJ. 2008;336:1174-7.	
Endocrinologic	Don't routinely order a thyroid ultrasound in patients with abnormal thyroid function tests if there is no palpable abnormality of the thyroid gland. *The Endocrine Society* *American Association of Clinical Endocrinologists*	Thyroid ultrasound is used to identify and characterize thyroid nodules, and is not part of the routine evaluation of abnormal thyroid function tests (over- or underactive thyroid function) unless the patient also has a large goiter or a lumpy thyroid. Incidentally discovered thyroid nodules are common. Overzealous use of ultrasound will frequently identify nodules, which are unrelated to the abnormal thyroid function, and may divert the clinical evaluation to assess the nodules, rather than the thyroid dysfunction. Imaging may be needed in thyrotoxic patients; when needed, a thyroid scan, not an ultrasound, is used to assess the etiology of the thyrotoxicosis and the possibility of focal autonomy in a thyroid nodule.	Bahn RS, Burch HB, Cooper DS, Garber JR, Greenlee MC, Klein I, Laurberg P, McDougall IR, Montori VM, Rivkees SA, Ross DS, Sosa JA, Stan MN; American Thyroid Association; American Association of Clinical Endocrinologists. Hyperthyroidism and other causes of thyrotoxicosis: management guidelines of the American Thyroid Association and American Association of Clinical Endocrinologists. Thyroid. 2011;21:593-646. Garber JR, Cobin RH, Gharib H, Hennessey JV, Klein I, Mechanick JI, Pessah-Pollack R, Singer PA, Woeber KA. Clinical practice guidelines for hypothyroidism in adults: cosponsored by the American Association of Clinical Endocrinologists and the American Thyroid Association. Endocr Pract. 2012; Sep 11:1-207.	American Association of Clinical Endocrinologists/American Thyroid Association guidelines
Endocrinologic	Don't order a total or free triiodothyronine (T3) level when assessing levothyroxine (T4) dose in hypothyroid patients. *The Endocrine Society* *American Association of Clinical Endocrinologists*	T4 is converted into T3 at the cellular level in virtually all organs. Intracellular T3 levels regulate pituitary secretion and blood levels of thyroid-stimulating hormone (TSH), as well as the effects of thyroid hormone in multiple organs; a normal TSH indicates an adequate T4 dose. Conversion of T4 to T3 at the cellular level may not be reflected in the T3 level in the blood. Compared to patients with intact thyroid glands, patients taking T4 may have higher blood T4 and lower blood T3 levels. Thus the blood level of total or free T3 may be misleading (low normal or slightly low); in most patients a normal TSH indicates a correct dose of T4.	Garber JR, Cobin RH, Gharib H, Hennessey JV, Klein I, Mechanick JI, Pessah-Pollack R, Singer PA, Woeber KA. Clinical practice guidelines for hypothyroidism in adults: cosponsored by the American Association of Clinical Endocrinologists and the American Thyroid Association. Endocr Pract. 2012; Sep 11:1-207.	American Association of Clinical Endocrinologists/American Thyroid Association guidelines
Endocrinologic **Urologic**	Don't prescribe testosterone therapy unless there is biochemical evidence of testosterone deficiency.	Many of the symptoms attributed to male hypogonadism are commonly seen in normal male aging or in the presence of comorbid conditions. Testosterone therapy has the potential for serious side effects and represents a significant expense. It is therefore important	Bhasin S, Cunningham GR, Hayes FJ, Matsumoto AM, Snyder PJ, Swerdloff RS, Montori VM. Testosterone therapy in adult men with androgen deficiency syndromes: an Endocrine Society clinical practice guideline. J Clin Endocrinol Metab. 2006 Jun;91(6):1995-2010. Wu FCW, Tajar A, Beynon JM, Pye SR, Silman AJ, Finn JD, O'Neill	Endocrine Society guideline

	The Endocrine Society *American Association of Clinical Endocrinologists*	to confirm the clinical suspicion of hypogonadism with biochemical testing. Current guidelines recommend the use of a total testosterone level obtained in the morning. A low level should be confirmed on a different day, again measuring the total testosterone. In some situations, a free or bioavailable testosterone may be of additional value.	TW, Bartfai G, Casanueva FF, Forti G, Giwercman A, Han TS, Kula K, Lean ME, Pendleton N, Punab M, Boonen S, Vanderschueren D, Labrie F, Huhtaniemi IT; EMAS Group. Identification of late-onset hypogonadism in middle-aged and elderly men. N Engl J Med. 2010 Jul 8;363(2):123-35.	
Endocrinologic	Don't order multiple tests in the initial evaluation of a patient with suspected thyroid disease. Order TSH, and if abnormal, follow up with additional evaluation or treatment depending on the findings. *American Society for Clinical Pathology*	The TSH test can detect subclinical thyroid disease in patients without symptoms of thyroid dysfunction. A TSH value within the reference interval excludes the majority of cases of primary overt thyroid disease. If the TSH is abnormal, confirm the diagnosis with free thyroxine (T4).	Garber JR, Cobin RH, Gharib H, Hennessey JV, Klein I, Mechanick JI, Pessah-Pollack R, Singer PA, Woeber KA; American Association of Clinical Endocrinologists and American Thyroid Association Taskforce on Hypothyroidism in Adults. ATA/AACE guidelines for hypothyroidism in adults. Endocr Pract. 2012;18(6):988-1028. Dufour DR. Laboratory tests of thyroid function: uses and limitations. Endocrinol Metab Clin North Am. 2007;36(3):579-94, v. U.S. Preventative Services Task Force. Screening for thyroid disease: recommendation statement. Ann Intern Med. 2004;140(2):125-7.	U.S. Preventive Services Task Force
Endocrinologic **Urologic**	Don't prescribe testosterone or testosterone products to men contemplating/ attempting to initiate pregnancy. *American Society for Reproductive Medicine*	Testosterone therapy is widely used as treatment for hypoandrogenemia and associated symptoms such as sexual dysfunction. However, it is well established that exogenous testosterone and other androgens can lead to decreased or absent sperm production, low sperm count, and infertility. Furthermore, this is not always reversible, even after removing the exogenous androgens.	Amory JK. Progress and prospects in male hormonal contraception. Curr Opin Endocrinol Diabetes Obes. 2008 Jun;15(3):255–60. Gu Y, Liang X, Wu W, Liu M, Song S, Cheng L, Bo L, Xiong C, Wang X, Liu X, Peng L, Yao K. Multicenter contraceptive efficacy trial of injectable testosterone undecanoate in Chinese men. J Clin Endocrinol Metab. 2009;94(6):1910–5. Moss JL, Crosnoe LE, Kim ED. Effect of rejuvenation hormones on spermatogenesis. Fertil Steril. 2013 jun;99(7):1814–20.	Randomized controlled trials

Topic area(s)	Recommendation	Rationale and comments	References	Source
Gastro-enterologic	Long-term acid suppression therapy for GERD should be titrated to the lowest effective dose. *American Gastroenterological Association*	The main identifiable risk associated with reducing or discontinuing acid suppression therapy is an increased symptom burden. It follows that the decision regarding the need for (and dosage of) maintenance therapy is driven by the impact of those residual symptoms on the patient's quality of life rather than as a disease control measure.	Kahrilas PJ, et al. American Gastroenterological Association medical position statement on the management of gastroesophageal reflux disease. Gastroenterology. 2008;135(4):1383-91.	American Gastro-enterological Association position statement

Gastro-enterologic **Pediatric**	Don't treat gastroesophageal reflux in infants routinely with acid suppression therapy. *Society of Hospital Medicine (Pediatric)*	Antireflux therapy has been demonstrated to have no effect in reducing the symptoms of GERD in children. Concerns regarding the use of proton pump inhibitor therapy in infants include an inability to definitively diagnose pediatric patients according to the established criteria of GERD, lack of documented efficacy of acid suppression therapy in infants, and the potential adverse effects associated with acid suppression therapy.	Vandenplas Y. Pediatric gastroesophageal reflux clinical practice guidelines. J Pediatr Gastroenterol Nutr. 2009;49: 498-547. Van der Pol RJ, et al. Efficacy of proton-pump inhibitors in children with gastroesophageal reflux: a systematic review. Pediatrics. 2011;127(5):925-35. Gibbons TE, et al. The use of proton pump inhibitors in children: a comprehensive review. Paediatr Drugs. 2003;5(1): 25-40. Orenstein SR, et al. Infants and proton pump inhibitors: tribulations, no trials. J Pediatr Gastroenterol Nutr. 2007;45:395-8. Khoshoo V, et al. Are we overprescribing antireflux medications for infants with regurgitation? Pediatrics. 2007;120:946-9.	Systematic review of RCTs
Gastro-enterologic	For a patient with functional abdominal pain syndrome, CT scans should not be repeated unless there is a major change in clinical findings or symptoms. *American Gastroenterological Association*	There is a small, but measurable increase in one's cancer risk from x-ray exposure. An abdominal CT scan is one of the higher radiation exposure x-rays — equivalent to three years of natural background radiation. Due to this risk and the high costs of this procedure, CT scans should be performed only when they are likely to provide useful information that changes patient management.	Drossman DA, et al. *Rome III: The Functional Gastrointestinal Disorders*. 3rd ed. 2006. Clouse RE, et al. Functional abdominal pain syndrome. Gastroenterology. 2006;130(5):1492-7. U.S. Food and Drug Administration. Reducing radiation from medical x-rays. February 19, 2009. http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm095505.htm. Image Wisely, U.S. Food and Drug Administration. My medical imaging history. http://www.radiologyinfo.org/en/safety/ImageWisely/7678_Medical%20Imaging%20History.pdf.	U.S. Food and Drug Administration
Gastro-enterologic **Pediatric** **Emergency medicine**	CT scans are not necessary in the routine evaluation of abdominal pain. *American Academy of Pediatrics*	Utilization of CT imaging in the emergency department evaluation of children with abdominal pain is increasing. The increased lifetime risk of cancer due to excess radiation exposure is of special concern given the acute sensitivity of children's organs. There also is the potential for radiation overdose with inappropriate CT protocols.	Brenner DJ, et al. Computed tomography–an increased risk of radiation exposure. N Engl J Med. 2007;357:2277-84. Burr A, et al. Glowing in the dark: time of day as a determinant of radiographic imaging in the evaluation of abdominal pain in children. J Pediatr Surgery. 2011;46(1): 188-91. Kyuseok Kim, et al. Low-dose abdominal CT for evaluating suspected appendicitis. N Engl J Med. 2012;366:1596-605. Stewart K, et al. Sonography for appendicitis: nonvisualiza-tion of the appendix is an indication for active clinical observation rather than direct referral for computed tomography. J Clin Ultrasound. 2012;40(8):455-61. Pearce MS, et al. Radiation exposure from CT scans in childhood and subsequent risk of leukaemia and brain tumours: a retrospective cohort study. Lancet. 2012; 380(9840):499-505. Saito JM. Beyond appendicitis: evaluation and surgical treatment of pediatric acute abdominal pain. Curr Opin Pediatr. 2012;24(3):357-	Expert consensus

			64.	
Gastro-enterologic	Don't prescribe medications for stress ulcer prophylaxis to medical inpatients unless at high risk for gastrointestinal complications. *Society of Hospital Medicine (Adult)*	According to published guidelines, medications for stress ulcer prophylaxis are not recommended for adult patients in non-intensive care unit settings. Histamine H2-receptor antagonists and proton pump inhibitors commonly used to treat stress ulcers are associated with adverse drug events and increased medication costs, and commonly enhance susceptibility to community-acquired nosocomial pneumonia and *Clostridium difficile*. Adherence to therapeutic guidelines will aid health care providers in reducing treatment of patients without clinically important risk factors for gastrointestinal bleeding.	ASHP therapeutic guidelines on stress ulcer prophylaxis. Am J Health Sys Pharm. 1999;56:347-79.	Expert consensus
Gastro-enterologic **Geriatric**	Don't recommend percutaneous feeding tubes in patients with advanced dementia. *American Academy of Hospice and Palliative Medicine* *American Geriatrics Society*	Careful hand feeding for patients with severe dementia is at least as good as tube feeding for the outcomes of death, aspiration pneumonia, functional status, and patient comfort. Food is the preferred nutrient. Tube feeding is associated with agitation, increased use of physical and chemical restraints, and worsening pressure ulcers.	Gabriel SE, et al. Getting the methods right–the foundation of patient-centered outcomes research. N Engl J Med. 2012;367(9):787-90. Teno JM, et al. Do financial incentives of introducing case mix reimbursement increase feeding tube use in nursing home residents? J Am Geriatr Soc. 2008;56(5):887-90. Teno JM, et al. Decision-making and outcomes of feeding tube insertion: a five-state study. J Am Geriatr Soc. 2011;59(5):881-6. Palecek EJ, et al. Comfort feeding only: a proposal to bring clarity to decision-making regarding difficulty with eating for persons with advanced dementia. J Am Geriatr Soc. 2010;58(3):580-4. Hanson LC, et al. Improving decision-making for feeding options in advanced dementia: a randomized, controlled trial. J Am Geriatr Soc. 2011;59(11):2009-16.	RCT
Gastro-enterologic	Don't use topical lorazepam (Ativan), diphenhydramine (Benadryl), and haloperidol (Haldol) ("ABH") gel for nausea. *American Academy of Hospice and Palliative Medicine*	Topical drugs can be safe and effective, such as topical NSAIDs for local arthritis symptoms. However, while topical gels are commonly prescribed in hospice practice, antinausea gels have not been proven effective in any large, well-designed or placebo-controlled trials. The active ingredients in ABH are not absorbed to systemic levels that could be effective. Only diphenhydramine (Benadryl) is absorbed via the skin, and then only after several hours and erratically at subtherapeutic levels. It is	Smith TJ, et al. ABH gel is not absorbed from the skin of normal volunteers. J Pain Symptom Manage. 2012;43(5): 961-6. Weschules DJ. Tolerability of the compound ABHR in hospice patients. J Palliat Med. 2005;8(6):1135-43.	Expert consensus

		therefore not appropriate for "as needed" use. The use of agents given via inappropriate routes may delay or prevent the use of more effective interventions.		
Gastro-enterologic **Geriatric**	Don't insert percutaneous feeding tubes in individuals with advanced dementia. Instead, offer oral assisted feedings. *American Medical Directors Association*	Strong evidence exists that artificial nutrition does not prolong life or improve quality of life in patients with advanced dementia. Substantial functional decline and recurrent or progressive medical illnesses may indicate that a patient who is not eating is unlikely to obtain any significant or long-term benefit from artificial nutrition. Feeding tubes are often placed after hospitalization, frequently with concerns for aspirations, and for those who are not eating. Contrary to what many people think, tube feeding does not ensure the patient's comfort or reduce suffering; it may cause fluid overload, diarrhea, abdominal pain, local complications, less human interaction and may increase the risk of aspiration. Assistance with oral feeding is an evidence-based approach to provide nutrition for patients with advanced dementia and feeding problems.	Teno JM, Gozalo PL, Mitchell SL, Kuo S, Rhodes RL, Bynum JP, Mor V. Does feeding tube insertion and its timing improve survival? J Am Geriatr Soc. 2012 Oct;60(10):1918-21. Hanson LC, Ersek M, Gilliam R, Carey TS. Oral feeding options for people with dementia: a systematic review. J Am Geriatr Soc. 2011;59(3):463-72. Palecek EJ, Teno JM, Casarett DJ, Hanson LC, Rhodes RL, Mitchell SL. Comfort feeding only: a proposal to bring clarity to decision-making regarding difficulty with eating for persons with advanced dementia. J Am Geriatr Soc. 2010;58(3):580-4. Sorrell JM. Use of feeding tubes in patients with advanced dementia: are we doing harm? J Psychosoc Nurs Ment Health Serv. 2010 May;48(5):15-8. Sampson EL, Candy B, Jones L. Enteral tube feeding for older people with advanced dementia. Cochrane Database Syst Rev. 2009 Apr 15;(2):CD007209. Gillick MR, Volandes AE. The standard of caring: why do we still use feeding tubes in patients with advanced dementia? J Am Med Dir Assoc. 2008 Jun;9(5):364-7. Ganzini L. Artificial nutrition and hydration at the end of life: ethics and evidence. Palliat Support Care. 2006 Jun;4(2):135-43. Li I. Feeding tubes in patients with severe dementia. Am Fam Physician. 2002 Apr 15;65(8):1605-11. Finucane TE, Christmas C, Travis K. Tube feeding in patients with advanced dementia: a review of the evidence. JAMA. 1999 Oct 13;282(14):1365-70. Mitchell SL, Kiely DK, Lipsitz LA. The risk factors and impact on survival of feeding tube placement in nursing home residents with severe cognitive impairment. Arch Intern Med. 1997 Feb 10;157(3):327-32.	Cochrane Database of Systematic Reviews
Gastro-enterologic **Pediatric**	Avoid using acid blockers and motility agents such as metoclopramide (generic) for	There is scant evidence that gastroesophageal reflux is a causative agent in many conditions though reflux may be a common association. There is accumulating evidence that acid-blocking and motility agents such as	Lightdale JR, Gremse DA; American Academy of Pediatrics Section on Gastroenterology, Hepatology, and Nutrition. Gastroesophageal reflux: management guidance for the pediatrician. Pediatrics. 2013 May;131(5):e1684–95.	Expert consensus

	physiologic gastroesophageal reflux that is effortless, painless, and not affecting growth. Do not use medication in the so-called "happy-spitter." *American Academy of Pediatrics*	metoclopramide (generic) are not effective in physiologic gastroesophageal reflux. Long-term sequelae of infant gastroesophageal reflux is rare, and there is little evidence that acid blockade reduces these sequelae. The routine performance of upper gastrointestinal tract radiographic imaging to diagnose gastroesophageal reflux or GERD is not justified. Parents should be counseled that gastroesophageal reflux is normal in infants and not associated with anything but stained clothes. Gastroesophageal reflux that is associated with poor growth or significant respiratory symptoms should be further evaluated.		
Gastro-enterologic **Neurologic**	Don't continue treatment for hepatic encephalopathy indefinitely after an initial episode with an identifiable precipitant. *American Association for the Study of Liver Diseases*	In circumstances where the precipitating factors are identified and well-controlled (e.g., recurrent infections, variceal bleeding) or liver function or nutritional status improved, prophylactic therapy may be discontinued.	Amodio P, et al. Practice Guidelines Committee of the American Association for the Study of Liver Diseases. Hepatic encephalopathy in chronic liver disease. Hepatology. 2014; [In Press].	AASLD guideline
Gastro-enterologic **Infectious disease**	Don't repeat hepatitis C viral load testing outside of antiviral therapy. *American Association for the Study of Liver Diseases*	Highly sensitive quantitative assays of hepatitis C RNA are appropriate at diagnosis and as part of antiviral therapy. Otherwise, the results of virologic testing do not change clinical management or outcomes.	Ghany MG, Strader DB, Thomas DL, Seeff LB. American Association for the Study of Liver Diseases. Diagnosis, management,and treatment of hepatitis C: an update. Hepatology. 2009 Apr;49(4):1335–74.	AASLD guideline
Gastro-enterologic	Don't perform CT or MRI routinely to monitor benign focal lesions in the liver unless there is a major change in clinical findings or symptoms.	Patients with benign focal liver lesions (other than hepatocellular adenoma) who don't have underlying liver disease and have demonstrated clinical and radiologic stability do not need repeated imaging.	Bioulac-Sage P, et al. Hepatocellular adenoma management and phenotypic classification: the Bordeaux experience. Hepatology. 2009;50(2):481–9.	Expert consensus

	American Association for the Study of Liver Diseases			
Gastro-enterologic **Infectious disease**	Avoid testing for a Clostridium difficile infection in the absence of diarrhea. *Infectious Diseases Society of America*	Testing for *Clostridium difficile* or its toxins should be performed only on diarrheal (unformed) stool, unless ileus due to *Clostridium difficile* is suspected. Because *Clostridium difficile* carriage is increased in patients on antimicrobial therapy and in patients in the hospital, only diarrheal stools warrant testing. In the absence of diarrhea, the presence of *Clostridium difficile* indicates carriage and should not be treated and, therefore, not tested.	Cohen SH, Gerding DN, Johnson S, Kelly CP, Loo VG, McDonald LC, Pepin J, Wilcox MH; Society for Healthcare Epidemiology of America; Infectious Diseases Society of America. Clinical practice guidelines for *Clostridium difficile* infection in adults: 2010 update by the Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (IDSA). Infect Control Hosp Epidemiol. 2010;31(5):431-55. Surawicz, Christina M, Brandt LJ, Binion DG, Ananthakrishnan AN, Curry SR, Gilligan PH, McFarland LV, Mellow M, Zuckerbraun BS. Guidelines for diagnosis, treatment, and prevention of Clostridium difficile infections. Am J Gastroenterol. 2013;108(4):478-98.	Society for Healthcare Epidemiology of America and Infectious Diseases Society of America guidelines

Topic area(s)	Recommendation	Rationale and comments	References	Source
Geriatric **Psychiatric/ psychologic**	Don't use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia, agitation, or delirium. *American Geriatrics Society*	Large-scale studies consistently show that the risk of motor vehicle accidents, falls, and hip fractures leading to hospitalization and death can more than double in older adults taking benzodiazepines and other sedative-hypnotics. Older patients, their caregivers, and their providers should recognize these potential harms when considering treatment strategies for insomnia, agitation, or delirium. Use of benzodiazepines should be reserved for alcohol withdrawal symptoms/delirium tremens or severe generalized anxiety disorder unresponsive to other therapies.	Finkle WD, et al. Risk of fractures requiring hospitalization after an initial prescription of zolpidem, alprazolam, lorazepam or diazepam in older adults. J Am Geriatr Soc. 2011;59(10): 1883-90. Allain H, et al. Postural instability and consequent falls and hip fractures associated with use of hypnotics in the elderly: a comparative review. Drugs Aging. 2005;22(9):749-65. American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2012;60(4):616-31.	AGS guideline
Geriatric **Neurologic** **Psychiatric/ psychologic**	Don't use antipsychotics as first choice to treat behavioral and psychological symptoms of dementia. *American Geriatrics Society*	People with dementia often exhibit aggression, resistance to care, and other challenging or disruptive behaviors. In such instances, antipsychotic medicines are often prescribed, but they provide limited benefit and can cause serious harm, including stroke and premature death. Use of these drugs should be limited to cases where nonpharmacologic measures have failed and patients pose an imminent threat to themselves or others. Identifying and addressing causes of behavior change can make	American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2012;60(4):616-31. National Institute for Health and Clinical Excellence and Social Care Institute for Excellence. NICE-SCIE clinical guidelines #42. http://www.nice.org.uk/CG042. Maher AR, et al. Efficacy and comparative effectiveness of atypical antipsychotic medications for off-label uses in adults: a systematic review and meta-analysis. JAMA. 2011;306(12): 159-60.	AGS, NICE guidelines

		drug treatment unnecessary.	Schnieder LS, et al. Effectiveness of atypical antipsychotics in patients with Alzheimer's disease. N Engl J Med. 2006;355 (15):1525-38.	
Geriatric	Don't delay palliative care for patients with a serious illness who have physical, psycho-logical, social, or spiritual distress because they are pursuing disease-directed treatment. *American Academy of Hospice and Palliative Medicine*	Numerous studies—including randomized trials—provide evidence that palliative care improves pain and symptom control, improves family satisfaction with care, and reduces costs. Palliative care does not accelerate death, and may prolong life in selected populations.	Delgado-Guay MO, et al. Symptom distress, intervention, and outcomes of intensive care unit cancer patients referred to a palliative care consult team. Cancer. 2009;115:437-45. Elsayem A, et al. Impact of a palliative care service on in-hospital mortality in a comprehensive cancer center. J Pall Med. 2006;9:894-902. Elsayem A, et al. Palliative care inpatient services in a comprehensive cancer center: clinical and financial outcomes. J Clin Oncol. 2004;22(10):2008-14. Gelfman LP, et al. Does palliative care improve quality? A survey of bereaved family members. J Pain Symptom Manage. 2008;36:22-8. Higginson IJ, et al. Is there evidence that palliative care teams alter end-of-life experiences of patients and their caregivers? J Pain Symptom Manage. 2003;25:150-68. Jordhoy MS, et al. A palliative care intervention and death at home: A cluster randomized trial. Lancet. 2000;356(9233): 888-93. London MR, et al. Evaluation of a comprehensive, adaptable, life-affirming, longitudinal (CALL) palliative care project. J Pall Med. 2005;8:1214-25. Temel JS, et al. Early palliative care for patients with metastatic non-small cell lung cancer. N Engl J Med. 2010;363:733-42.	RCTs
Geriatric **Psychiatric**	Don't prescribe antipsychotic medications for behavioral and psychological symptoms of dementia in individuals with dementia without an assessment for an underlying cause of the behavior. *American Medical Directors Association*	Careful differentiation of cause of the symptoms (physical or neurological versus psychiatric, psychological) may help better define appropriate treatment options. The therapeutic goal of the use of antipsychotic medications is to treat patients who present an imminent threat of harm to self or others, or are in extreme distress–not to treat nonspecific agitation or other forms of lesser distress. Treatment of BPSD in association with the likelihood of imminent harm to self or others includes assessing for and identifying and treating underlying causes (including pain; constipation; and environmental factors such as noise, being too cold or warm, etc.), ensuring safety, reducing distress and supporting the patient's functioning. If treatment of other	American Medical Directors Association. Dementia in the long-term care setting clinical practice guideline. Columbia, Md.: AMDA 2012. Perkins, R. Evidence-based practice interventions for managing behavioral and psychological symptoms of dementia in NH residents. Ann LTC. 2012:20(12):20-4. Flaherty J, Gonzales J, Dong B. Antipsychotics in the treatment of delirium in older hospitalized adults: a systematic review. JAGS. 2011;59:S269-76. American Medical Directors Association. Delirium and acute problematic behavior clinical practice guideline. Columbia, Md.: AMDA 2008. Ozbolt LB, Paniagua MA, Kaiser RM. Atypical antipsychotics for the treatment of delirious elders. J Am Med Dir Association. 2008;9:18-28. U.S. Food and Drug Administration. Information for healthcare	American Medical Directors Association guidelines and systematic reviews

		potential causes of the BPSD is unsuccessful, antipsychotic medications can be considered, taking into account their significant risks compared to potential benefits. When an antipsychotic is used for BPSD, it is advisable to obtain informed consent.	professionals: antipsychotics. FDA Alert [Internet]. 2008 Jun 16. [cited 2008 Sep 23]. Available from: http://www.fda.gov/cder/drug/InfoSheets/HCP/antipsychotics_conventional.htm. Accessed 9/23/08. U.S. Food and Drug Administration, U.S. Department of Health and Human Services. 2007 information for healthcare professionals: haloperidol (marketed as Haldol, Haldol decanoate, and Haldol lactate) [Internet]. 2007 Sep 17 [cited 2013 Jul 23]. Available from: http://www.fda.gov/cder/drug/InfoSheets/HCP/haloperidol.htm. Schneeweiss S, Setoguchi S, Brookhart A, Dormuth C, Wang PS. Risk of death associated with the use of conventional versus atypical antipsychotic drugs among elderly patients. CMAJ 2007;176(5):627-32. Gill SS, Bronskill SE, Normand SL, Anderson GM, Sykora K, Lam K, Bell CM, Lee PE, Fischer HD, Herrmann N, Gurwitz JH, Rochon PA. Antipsychotic drug use and mortality in older adults with dementia. Ann Intern Med. 2007;146(11):775-86. Schneider LS, Dagerman KS, Insel P. Risk of death with atypical antipsychotic drug treatment for dementia. N Engl J Med. 2005 Oct 19;294(15):1934-43. Schneider LS, Tariot PN, Dagerman KS. Effectiveness of atypical antipsychotic drugs in patients with Alzheimer's disease. N Engl J Med. 2006;355(15):1525-38. Sink KM, Holden KF, Yaffe K. Pharmacological treatment of neuropsychiatric symptoms of dementia: a review of the evidence. JAMA. 2005;293:596-608. U.S. Food and Drug Administration, U.S. Department of Health and Human Services. FDA public health advisory: deaths with antipsychotics in elderly patients with behavioral disturbances [Internet]. 2005 Apr 11. [cited 2013 Jul 23]. Available from: http://www.fda.gov/cder/drug/advisory/antipsychotics.htm. Schneider LS, Dagerman KS, Insel P. Risk of death with atypical antipsychotic drug treatment for dementia: meta-analysis of randomized placebo-controlled trials. JAMA. 2005;294(15):1934-1943.	
Geriatric **Psychiatric**	Don't use antipsychotics as first choice to treat behavioral and	Behavioral and psychological symptoms of dementia are defined as the noncognitive symptoms and behaviors, including agitation or aggression, anxiety, irritability, depression,	American Psychiatric Association: Practice guideline for the treatment of patients with Alzheimer's disease and other dementias, second edition. Am J Psychiatry. 2007 Dec;164(Dec suppl):5-56. Available from:	AHRQ, Cochrane Database of Systematic

	psychological symptoms of dementia. *American Psychiatric Association*	apathy, and psychosis. Evidence shows that risks (e.g., cerebrovascular effects, mortality, parkinsonism or extrapyramidal signs, sedation, confusion and other cognitive disturbances, and increased body weight) tend to outweigh the potential benefits of antipsychotic medications in this population. Clinicians should limit the use of antipsychotic medications to cases where nonpharmacologic measures have failed and the patients' symptoms may create a threat to themselves or others. This item is also included in the American Geriatric Society's list of recommendations for "Choosing Wisely."	http://psychiatryonline.org/content.aspx?bookid=28&sectionid=1679489. Ballard CG, Waite J, Birks J. Atypical antipsychotics for aggression and psychosis in Alzheimer's disease. Cochrane Database Syst Rev. 2006 Jan 25;(1):CD003476. Gitlin LN, Kales HC, Lyketsos CG. Nonpharmacologic management of behavioral symptoms in dementia. JAMA. 2012 Nov 21;308(19):2020-9. Maglione M, Ruelaz Maher A, Hu J, Wang Z, Shanman R, Shekelle PG, Roth B, Hilton L, Suttorp MJ, Ewing BA, Motala A, Perry T; Southern California Evidence-Based Practice Center. Off-label use of atypical antipsychotics: an update. Rockville, Md.: Agency for Healthcare Research and Quality; 2011 Sep 437 p. Report No.: HHSA290-2007-10062-1. Nasrallah HA. Atypical antipsychotic-induced metabolic side effects: insights from receptor-binding profiles. Mol Psychiatry. 2008 Jan;13(1):27-35. Richter T, Meyer G, Möhler R, Köpke S. Psychosocial interventions for reducing antipsychotic medication in care home residents. Cochrane Database Syst Rev. 2012 Dec 12;12:CD008634. Schneider LS, Tariot PN, Dagerman KS, Davis SM, Hsiao JK, Ismail MS, Lebowitz BD, Lyketsos CG, Ryan JM, Stroup TS, Sultzer DL, Weintraub D, Lieberman JA; CATIE-AD Study Group. Effectiveness of atypical antipsychotic drugs in patients with Alzheimer's disease. N Engl J Med. 2006;355(15):1525-38.	Reviews
Geriatric	Don't continue life support for patients at high risk for death or severely impaired functional recovery without offering patients and their families the alternative of care focused entirely on comfort. *Critical Care Societies Collaborative–Critical Care*	Patients and their families often value the avoidance of prolonged dependence on life support. However, many of these patients receive aggressive life-sustaining therapies, in part due to clinicians' failures to elicit patients' values and goals, and to provide patient-centered recommendations. Routinely engaging high-risk patients and their surrogate decision makers in discussions about the option of foregoing life-sustaining therapies may promote patients' and families' values, improve the quality of dying and reduce family distress and bereavement. Even among patients pursuing life-sustaining therapy, initiating palliative care simultaneously with ongoing	Fields MJ, Cassel CK. Approaching death, improving care at the end of life. Washington, D.C.: National Academy Press; 1997: 437. Angus DC, Barnato AE, Linde-Zwirble WT, Weissfeld LA, Watson RS, Rickert T, Rubenfeld GD; Robert Wood Johnson Foundation ICU End-Of-Life Peer Group. Use of intensive care at the end of life in the United States: an epidemiologic study. Crit Care Med. 2004;32(3):638–43. Curtis JR, Engelberg RA, Wenrich MD, Shannon SE, Treece PD, Rubenfeld GD. Missed opportunities during family conferences about end-of-life care in the intensive care unit. Amer J Respir Crit Care Med. 2005;171:844–9. Gries CJ, Engelberg RA, Kross EK, Zatzick D, Nielsen EL, Downey L, Curtis JR. Predictors of symptoms of posttraumatic stress and depression in family members after patient death in the ICU. Chest.	Expert consensus

	[Societies: American Association of Critical-Care Nurses, American College of Chest Physicians, American Thoracic Society, and Society of Critical Care Medicine]	disease-focused therapy may be beneficial.	2010;137(2):280–7.	
Geriatric **Neurologic** **Psychiatric**	Don't prescribe cholinesterase inhibitors for dementia without periodic assessment for perceived cognitive benefits and adverse gastrointestinal effects. *American Geriatrics Society*	In randomized controlled trials, some patients with mild-to-moderate and moderate-to-severe Alzheimer's disease achieve modest benefits in delaying cognitive and functional decline and decreasing neuropsychiatric symptoms. The impact of cholinesterase inhibitors on institutionalization, quality of life and caregiver burden are less well established. Clinicians, caregivers, and patients should discuss cognitive, functional, and behavioral goals of treatment prior to beginning a trial of cholinesterase inhibitors. Advance care planning, patient and caregiver education about dementia, diet and exercise, and nonpharmacologic approaches to behavioral issues are integral to the care of patients with dementia, and should be included in the treatment plan in addition to any consideration of a trial of cholinesterase inhibitors. If goals of treatment are not attained after a reasonable trial (e.g., 12 weeks), then consider discontinuing the medication. Benefits beyond a year have not been investigated and the risks and benefits of long-term therapy have not been well established.	Courtney C, Farrell D, Gray R, Hills R, Lynch L, Sellwood E, Edwards S, Hardyman W, Raftery J, Crome P, Lendon C, Shaw H, Bentham P; AD2000 Collaborative Group. Long-term donepezil treatment in 565 patients with Alzheimer's disease (AD2000): randomized double-blind trial. Lancet. 2004 Jun 26;363(9427):2105–15. American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2012 Apr;60(4):616–31. Kaduszkiewicz H, Zimmermann T, Beck-Bornholdt HP, van den Bussche H. Cholinesterase inhibitors for patients with Alzheimer's disease: systematic review of randomized clinical trials. BMJ. 2005 Aug 6;331(7512):321–7. Birks J. Cholinesterase inhibitors for Alzheimer's disease. Cochrane Database Syst Rev. 2006 Jan 25;(1):CD005593.	Systematic reviews
Geriatric	Avoid using prescription appetite stimulants or high-calorie supplements for treatment of anorexia or cachexia in older adults; instead, optimize social	Unintentional weight loss is a common problem for medically ill or frail elderly. Although high-calorie supplements increase weight in older people, there is no evidence that they affect other important clinical outcomes, such as quality of life, mood, functional status, or survival. Use of megestrol acetate results in minimal improvements in	Hanson LC, Ersek M, Gilliam R, Carey TS. Oral feeding options for people with dementia: a systematic review. J Am Geriatr Soc. 2011;59:463–72. Milne AC, Potter J, Vivanti A, Avenell A. Protein and energy supplementation in elderly people at risk from malnutrition. Cochrane Database Syst Rev. 2009Apr 15;2:CD003288. Ruiz Garcia V, López-Briz E, Carbonell Sanchis R, Gonzalvez Perales JL, Bort-Marti S. Megestrol acetate for treatment of anorexia-cachexia	Cochrane Database of Systematic Reviews

	supports, provide feeding assistance, and clarify patient goals and expectations. *American Geriatrics Society*	appetite and weight gain, no improvement in quality of life or survival, and increased risk of thrombotic events, fluid retention, and death. In patients who take megestrol acetate, one in 12 will have an increase in weight and one in 23 will die. The 2012 AGS Beers criteria list megestrol acetate and cyproheptadine as medications to avoid in older adults. Systematic reviews of cannabinoids, dietary polyunsaturated fatty acids (docosahexaenoic acid and elcosapentaenoic acid), thalidomide, and anabolic steroids, have not identified adequate evidence for the efficacy and safety of these agents for weight gain. Mirtazapine is likely to cause weight gain or increased appetite when used to treat depression, but there is little evidence to support its use to promote appetite and weight gain in the absence of depression.	syndrome. Cochrane Database Syst Rev. 2013 Mar 28;3:CD004310. American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2012 Apr;60(4):616–31. Mazotta P, Jeney CM. Anorexia-cachexia syndrome: a systematic review of the role of dietary polyunsaturated fatty acids in the management of symptoms, survival, and quality of life. J Pain Symptom Manage. 2009;37:1069–77. Dewey A, Baughan C, Dean TP, Higgins B, Johnson I. Eicosapentaenoic acid (EPA, an omega-3 fatty acid from fish oils) for the treatment of cancer cachexia. Cochrane Database Syst Rev. 2007;Jan 24;1:CD004597. Reid J, Mills M, Cantwell M, Cardwell CR, Murray LJ, Donnelly M. Thalidomide for managing cancer cachexia. Cochrane Database Syst Rev. 2012;Apr 18;4:CD008664. Yavuzsen T, Davis MP, Walsh D, LeGrand S, Lagman R. Systematic review of the treatment of cancer-associated anorexia and weight loss. J Clin Oncol. 2005;23:8500–11. Watanabe N, Omori IM, Nakagawa A, Cipriani A, Barbui C, Churchill R, Furukawa TA. Mirtazapine versus other antidepressive agents for depression. Cochrane Database Syst Rev. 2011;Dec 7;12:CD006528. Fox CB, Treadway AK, Blaszczyk, Sleeper RB. Megestrol acetate and mirtazapine for the treatment of unplanned weight loss in the elderly. Pharmacotherapy. 2009;29(4):383–97.	
Geriatric	Don't prescribe a medication without conducting a drug regimen review. *American Geriatrics Society*	Older patients disproportionately use more prescription and nonprescription drugs than other populations, increasing the risk for side effects and inappropriate prescribing. Polypharmacy may lead to diminished adherence, adverse drug reactions and increased risk of cognitive impairment, falls, and functional decline. Medication review identifies high-risk medications, drug interactions, and those continued beyond their indication. Additionally, medication review elucidates unnecessary medications and underuse of medications, and may reduce medication burden. Annual review of medications is an indicator for quality	National Committee for Quality Assurance. Improving quality and patient experience – the state of health care quality 2013. Washington (DC): National Committee for Quality Assurance; 2013 Oct. 206 p. Shrank WH, Polinski JM, Avorn J. Quality indicators for medication use in vulnerable elders. J Am Geriatr Soc. 2007;55 (suppl 2):S373–82. Hajjar ER, Cafiero AC, Hanlon JT. Polypharmacy in elderly patients. Am J Geriatr Pharm. 2007 Dec;5(4):345–51. Steinman MA, Hanlon JT. Managing medications in clinically complex elders: "There's got to be a happy medium." JAMA. 2010 Oct 13;304(14):1592–1601. Drenth-van Maanen AC, van Marum RJ, Knol W, van der Linden CM, Jansen PA. Prescribing optimization method for improving prescribing in elderly patients receiving polypharmacy. Drugs Aging.	Expert consensus

		prescribing in vulnerable elderly.	2009;26(8):687–701.	
Geriatric Medicine **Preventive Medicine** **Sports Medicine**	Don't prescribe under-dosed strength training programs for older adults. Instead, match the frequency, intensity, and duration of exercise to the individual's abilities and goals. *American Physical Therapy Association*	Improved strength in older adults is associated with improved health, quality of life, and functional capacity, and with a reduced risk of falls. Older adults are often prescribed low dose exercise and physical activity that are physiologically inadequate to increase gains in muscle strength. Failure to establish accurate baseline levels of strength limits the adequacy of the strength training dosage and progression, and thus limits the benefits of the training. A carefully developed and individualized strength training program may have significant health benefits for older adults.	Silva NL, Oliveira RB, Fleck SJ, Leon AC, Farinatti P. Influence of strength training variables on strength gains in adults over 55 years old: a meta-analysis of dose-response relationships. J Sci Med Sport. 2014;17(3):337–44. Raymond MJ, Bramley-Tzerefos RE, Jeffs KJ, Winter A, Holland AE. Systematic review of high-intensity progressive resistance strength training of the lower limb compared with other intensities of strength training in older adults. Arch Phys Med Rehabil. 2013;94(8):1458–72. Valenzuela T. Efficacy of progressive resistance training interventions in older adults in nursing homes: a systematic review. J Am Med Dir Assoc. 2012;13(5):418–28. Mayer F, Scharhag-Rosenberger F, Carlsohn A, Cassel M, Muller S, Scharhag J. The intensity and effects of strength training in the elderly. Dtsch Arztebl Int. 2011;108(21):359–64. Nicola F, Catherine S. Dose-response relationship of resistance training in older adults: a meta-analysis. Br J Sports Med. 2011;45(3):233–4.	Systematic reviews
Geriatric Medicine	Don't recommend aggressive or hospital-level care for a frail elder without a clear understanding of the individual's goals of care and the possible benefits and burdens. *The Society for Post-Acute and Long-Term Care Medicine*	Hospital-level care has known risks, including delirium, infections, side effects of medications and treatments, disturbance of sleep, and loss of mobility and function. These risks are often more significant for patients in the post-acute and long-term care setting, who are more likely to be frail and to have multimorbidity, functional limitations, and dementia. Therefore, for some frail elders, the balance of benefits and harms of hospital-level care may be unfavorable. To avoid unnecessary hospitalizations, care providers should engage in advance care planning by defining goals of care for the patient and discussing the risks and benefits of various interventions, including hospitalization, in the context of prognosis, preferences, indications, and the balance of risks and benefits. Advance directives such as the Physician Orders for Life Sustaining Treatment paradigm form and Do Not Hospitalize orders communicate a patient's preferences about end-of-life care. Patients	Creditor MC. Hazards of hospitalization of the elderly. Ann Intern Med. 1993 Feb 1;118(3):219. Deciding About Going to the Hospital. Interact v4.0 Tool. Florida Atlantic University; 2011 [cited 2015 Jan 2]. Available from: http://interact2.net/docs/INTERACT%20Version%204.0%20Tools/INTERACT%20V%204%20Deciding_About_Going_to_Hosptial%20Nov%2017%202014.pdf. Inouye SK, Westendorp RG, Saczynski JS. Delirium in elderly people. Lancet. 2014 Mar 8;383(9920):911-22. Murray LM, Laditka SB. Care transitions in older adults from nursing homes to hospitals: implications for long-term care practice, geriatrics education, and research. J Am Med Dir Assoc. 2010 May;11(4):231-8. Tulsky JA. Beyond advance directives: importance of communication skills at the end of life. JAMA. 2005 Jul 20;294(3):359-65.	Expert consensus

		with Do Not Hospitalize orders are less likely to be hospitalized than those who do not have these directives. Patients who opt for less-aggressive treatment options are less likely to be subjected to unnecessary, unpleasant, and invasive interventions and the risks of hospitalization.		

Topic area(s)	Recommendation	Rationale and comments	References	Source
Gynecologic	Don't perform low-risk HPV testing. *American Society for Clinical Pathology*	National guidelines provide for HPV testing in patients with certain abnormal Pap smears and in other select clinical indications. The presence of high-risk HPV leads to more frequent examination or more aggressive investigation (e.g., colposcopy and biopsy). There is no medical indication for low-risk HPV testing (HPV types that cause genital warts or very minor cell changes on the cervix) because the infection is not associated with disease progression and there is no treatment or therapy change indicated when low-risk HPV is identified.	Lee JW, et al. Low-risk human papillomavirus testing and other non-recommended human papillomavirus testing practices among U.S. health care providers. Obstet Gynecol. 2011;118(1):4-13. Saslow D, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. Am J Clin Pathol. 2012;137:516-42. Zhao C, et al. Follow-up outcomes for a large cohort of U.S. women with negative imaged liquid-based cytology finding sand positive high risk human papillomavirus test results. Gynecol Oncol. 2011;122:291-6. American Society for Colposcopy and Cervical Pathology. Descriptions of new FDA-approved HPV DNA tests. HPV genotyping clinical update. 2009. http://mail.ny.acog.org/website/ASCCPHPVUpdate.pdf.	ACS/ASCCP/ ASCP guideline
Gynecologic **Oncologic**	Don't treat patients who have mild cervical dysplasia of less than two years' duration. *American College of Obstetricians and Gynecologists*	Mild dysplasia (cervical intraepithelial neoplasia 1) is associated with the presence of HPV, which does not require treatment in average-risk women. Most women with cervical intraepithelial neoplasia 1 on biopsy have a transient HPV infection that will usually clear in less than 12 months and, therefore, does not require treatment.	Wright TC, et al. 2006 consensus guidelines for the manage-ment of women with cervical intraepithelial neoplasia or adenocarcinoma in situ. Am J Obstet Gynecol. 2007;197:340-5. American College of Obstetricians and Gynecologists. Management of abnormal cervical cytology and histology. Practice bulletin no. 99. Obstet Gynecol. 2008;112:1419-44.	ASCCP, ACOG guidelines
Gynecologic	Don't require a pelvic exam or other physical exam to prescribe oral contraceptive medications. *American Academy of Family Physicians*	Hormonal contraceptives are safe, effective, and well-tolerated for most women. Data do not support the necessity of performing a pelvic or breast examination to prescribe oral contraceptive medications. Hormonal contraception can be safely provided on the basis of medical history and blood pressure measurement.	Stewart FH, Harper CC, Ellertson CE, Grimes DA, Sawaya GF, Trussell J. Clinical breast and pelvic examination requirements for hormonal contraception: current practice vs evidence. JAMA. 2001 May 2;285(17):2232-9. Henderson JT, Sawaya GF, Blum M, Stratton L, Harper CC. Pelvic examinations and access to oral hormonal contraception. Obstet Gynecol. 2010 Dec;116(6):1257-64. Committee on Gynecologic Practice. Committee opinion no. 534: well-	ACOG

			woman visit. Obstet Gynecol. 2012 Aug;120(2 Pt 1):421-4.	
Gynecologic	Don't routinely order thrombophilia testing on patients undergoing a routine infertility evaluation. *American Society for Reproductive Medicine*	There is no indication to order these tests, and there is no benefit to be derived in obtaining them in someone that does not have any history of bleeding or abnormal clotting and in the absence of any family history. This testing is not a part of the infertility workup. Furthermore, the testing is costly, and there are risks associated with the proposed treatments, which would also not be indicated in this routine population.	Lockwood C, Wendel G; Committee on Practice Bulletins—Obstetrics. Practice bulletin no. 124: inherited thrombophilias in pregnancy. Obstet Gynecol. 2011 Sept;118(3):730-40. Casadei L, Puca F, Privitera L, Zamaro V, Emidi E. Inherited thrombophilia in infertile women: implication in unexplained infertility. Fertil Steril. 2010 Jul;94(2):755-7. The Practice Committee of the American Society for Reproductive Medicine. Diagnostic evaluation of the infertile female: a committee opinion. Fertil Steril. 2012 Aug;98:302-7. Baglin T, Gray E, Greaves M, Hunt B, Keeling D, Machin S, Mackie I, Makris M, Nokes T, Perry D, Talt RC, Walker I, Watson H. Clinical guidelines for testing for heritable thrombophilia. Br J Haematol. 2010;149:209-20.	ACOG
Gynecologic	Don't perform immunological testing as part of the routine infertility evaluation. *American Society for Reproductive Medicine*	Diagnostic testing of infertility requires evaluation of factors involving ovulation, fallopian tube patency and spermatogenesis based upon clinical history. Although immunological factors may influence early embryo implantation, routine immunological testing of couples with infertility is expensive and does not predict pregnancy outcome.	Cervera R, Balasch J. Bidirectional effects on autoimmunity and reproduction. Hum Reprod. 2008;14:359-66. Carp HJA, Selmi C, Shoenfel Y. The autoimmune bases of infertility and pregnancy loss. J Autoimmun. 2012;38:J266-74.	Expert consensus
Gynecologic	Don't obtain a karyotype as part of the initial evaluation for amenorrhea. *American Society for Reproductive Medicine*	Amenorrhea is the absence of menstruation and can be attributed to many causes. A karyotype (chromosomal analysis) is not indicated as an initial test for amenorrhea as it is not a screening test. However, it is indicated to further evaluate the etiology of an elevated follicle-stimulating hormone in a woman under 40 years of age or in the presence of physical findings suggestive of disorders of sexual development.	Baker VL. Primary ovarian insufficiency in the adolescent. Curr Opin Obstet Gynecol. 2013 Oct;25(5):375-81. Nelson LM, Covington SN, Rebar RW. An update: spontaneous premature ovarian failure is not an early menopause. Fertil Steril. 2005 May;83(5):1327–32. Bachmann GA, Kemmann E. Prevalence of oligomenorrhea and amenorrhea in a college population. Am J Obstet Gynecol. 1982 Sep 1;144(1):98–102. Reindollar RH, Byrd JR, McDonough PG. Delayed sexual development: a study of 252 patients. Am J Obstet Gynecol. 1981 Jun 15;140(4):371–80. Reindollar RH, Novak M, Tho SP, McDonough PG. Adult-onset amenorrhea: a study of 262 patients. Am J Obstet Gynecol. 1986 Sep;155(3):531–43. Klein DA, Poth MA. Amenorrhea: an approach to diagnosis and management. Am Fam Physician. 2013 Jun 1;87(11):781–8.	Expert consensus
Gynecologic	Don't obtain follicle-	Menstrual bleeding patterns for women after	Paramsothy P, Harlow SD, Greendale GA, Gold EB, Crawford SL,	Prospective

	stimulating hormone levels in women in their 40s to identify the menopausal transition as a cause of irregular or abnormal menstrual bleeding. *American Society for Reproductive Medicine*	age 40 are less predictable than in the younger years due to the normal menopausal transition. Menopause is defined as the absence of menstrual periods for one year when no other cause can be identified (it is often accompanied by symptoms such as hot flashes and night sweats). During this time, blood levels of follicle-stimulating hormone vary both from woman to woman and from day to day in the same woman. A follicle-stimulating hormone level does not predict when the transition to menopause will occur, diagnose that it has begun, or provide reassurance that contraception is no longer necessary. If there are no other causes of irregular or abnormal bleeding, the treatment for these women will not change based on the follicle-stimulating hormone level.	Elliott MR, Lisabeth LD, Randolph JF Jr. Bleeding patterns during the menopausal transition in the multi-ethnic Study of Women's Health Across the Nation (SWAN): a prospective cohort study. BJOG. 2014 Nov;121(12):1564–73. Harlow SD, Lin X, Ho MJ. Analysis of menstrual diary data across the reproductive life span applicability of the bipartite model approach and the importance of within-woman variance. J Clin Epidemiol. 2000 Jul;53(7):722–33. Treloar AE, Boynton RE, Behn BG, Brown BW. Variation of the human menstrual cycle through reproductive life. Int J Fertil. 1967 Jan-Mar;12(1 Pt 2):77–126. Vollman RF. The degree of variability of the length of the menstrual cycle in correlation with age of woman. Gynaecologia. 1956 Nov;142(5):310–4. Burger HG, Hale GE, Robertson DM, Dennerstein L. A review of hormonal changes during the menopausal transition: focus on findings from the Melbourne Women's Midlife Health Project. Hum Reprod Update. 2007 Nov–Dec;13(6):559–65. Burger HG. Diagnostic role of follicle-stimulating hormone (FSH) measurements during the menopausal transition–an analysis of FSH, oestradiol and inhibin. Eur J Endocrinol. 1994 Jan;130(1):38-42.	cohort studies
Gynecologic	Don't perform endometrial biopsy in the routine evaluation of infertility. *American Society for Reproductive Medicine*	Endometrial biopsy performed for histologic dating does not distinguish fertile from infertile women. Chronic endometritis on endometrial biopsy does not predict the likelihood of pregnancy in general nor is it associated with live birth rates in assisted reproductive technology cycles. Endometrial biopsy should not be utilized in the routine evaluation of infertility.	Coutifaris C, Myers ER, Guzick DS, Diamond MP, Carson SA, Legro RS, et al; NICHD National Cooperative Reproductive Medicine Network. Histological dating of timed endometrial biopsy tissue is not related to fertility status. Fertil Steril 2004 Nov;82(5):1264-72. Murray MJ, Meyer WR, Zaino RJ, Lessey BA, Novotny DB, Ireland K, Zeng D, Fritz MA. A critical analysis of the accuracy, reproducibility, and clinical utility of histologic endometrial dating in fertile women. Fertil Steril. 2004 May;81(5):1333–43. Batista MC, Cartledge TP, Merino MJ, Axiotis C, Platia MP, Merriam GR, Loriaux DL, Nieman LK. Midluteal phase endometrial biopsy does not accurately predict luteal function. Fertil Steril. 1993 Feb;59(2):294–300. Gibson M. Clinical evaluation of luteal function. Semin Reprod Endocrinol. 1990;8:130–41. Dockery P, Li TC, Rogers AW, Cooke ID, Lenton EA, Warren MA. An examination of the variation in timed endometrial biopsies. Hum Reprod. 1988 Aug;3(6):715–20. Kasius JC, Fatemi HM, Bourgain C, Sie-Go DM, Eijkemans RJ, Fauser BC, Devroey P, Broekmans FJ. The impact of chronic	Expert consensus

			endometritis on reproductive outcome.Fertil Steril. 2011 Dec;96(6):1451–6. Haggerty C, Ness RB, Amortegui A, Hendrix SL, Hillier SL, Holley RL, Peipert J, Randall H, Sondheimer SJ, Soper DE, Sweet RL, Trucco G. Endometritis does not predict reproductive morbidity after pelvic inflammatory disease. Am J Obstet Gynecol. 2003 Jan;188(1):141–8.	
Gynecologic	Don't perform prolactin testing as part of the routine infertility evaluation in women with regular menses. *American Society for Reproductive Medicine*	It has become common practice to obtain prolactin levels in the routine infertility evaluation. However, there is no reason to expect that a woman would exhibit clinically significant, elevated prolactin levels in the presence of normal menstrual cycles and without galactorrhea (milk discharge from breast). Therefore, serum testing of prolactin levels in a normally menstruating woman without galactorrhea provides no benefit and would not impact clinical management.	Glazener CM, Kelly NJ, Hull MG. Prolactin measurement in the investigation of infertility in women with a normal menstrual cycle. Br J Obstet Gynaecol. 1987 Jun;94(6):535–8. Kostrzak A, Warenik-Szymankiewicz A, Meczekalski B. The role of serum PRL bioactivity evaluation in hyperprolactinaemic women with different menstrual disorders. Gynecol Endocrinol. 2009 Dec;25(12):799–806.	Expert consensus
Gynecologic	Don't exclude pessaries as a treatment option for pelvic organ prolapse. *American Urogynecologic Society*	Nonsurgical treatment options for pelvic organ prolapse include pessaries, which are removable devices that are placed into the vagina to support the prolapsed organs (i.e., uterus, vagina, bladder and/or rectum). A pessary trial can be offered to almost all women with pelvic organ prolapse. Exceptions include women with an active vaginal infection and those who would be noncompliant with follow-up.	Culligan PJ. Nonsurgical management of pelvic organ prolapse. Obstet Gynecol. 2012 Apr;119(4):852-60. ACOG Practice Bulletin No. 85: Pelvic organ prolapse. Obstet Gynecol. 2007 Sep;110(3):717-29. Bugge C, Adams EJ, Gopinath D, Reid F. Pessaries (mechanical devices) for pelvic organ prolapse in women. Cochrane Database Syst Rev. 2013 Feb 28;2:CD004010.	Cochrane review

Topic area(s)	Recommendation	Rationale and comments	References	Source
Hematologic	Don't perform repetitive complete blood count and chemistry testing in the face of clinical and lab stability. *Society of Hospital Medicine (Adult)*	Hospitalized patients frequently have considerable volumes of blood drawn (phlebotomy) for diagnostic testing during short periods of time. Phlebotomy is highly associated with changes in hemoglobin and hematocrit levels for patients and can contribute to anemia. This anemia, in turn, may have significant consequences, especially for patients with cardiorespiratory diseases. Additionally, reducing the frequency of daily unnecessary phlebotomy can result in	Adam C, et al. Diagnostic blood loss from phlebotomy and hospital-acquired anemia during acute myocardial infarction. Arch Intern Med. 2011;171(18):1646-53. Thavendiranathan P, et al. Do blood tests cause anemia in hospitalized patients? The effect of diagnostic phlebotomy on hemoglobin and hematocrit levels. J Gen Intern Med. 2005;20(6):520-4. Stuebing EA, et al. Surgical vampires and rising health care expenditure: reducing the cost of daily phlebotomy. Arch Surg. 2011;146(5):524-7.	Prospective studies

		significant cost savings for hospitals.		
Hematologic	Avoid transfusions of red blood cells for arbitrary hemoglobin or hematocrit thresholds and in the absence of symptoms or active coronary disease, heart failure, or stroke. *Society of Hospital Medicine (Adult)*	The AABB recommends adhering to a restrictive transfusion strategy (7 to 8 g/dL) in hospitalized, stable patients. The AABB suggests that transfusion decisions be influenced by symptoms as well as hemoglobin concentration. According to a National Institutes of Health Consensus Conference, no single criterion should be used as an indication for red cell component therapy. Instead, multiple factors related to the patient's clinical status and oxygen delivery needs should be considered.	Red blood cell transfusion: a clinical practice guideline from the AABB. Ann Intern Med. 2012;157(1):49-58. Consensus conference. Perioperative red blood cell transfusion. JAMA. 1988;260(18):2700-3. AABB. Advancing Transfusion and Cellular Therapies Worldwide. AABB name change. http://www.aabb.org/about/who/Pages/namechange.aspx.	AABB guideline
Hematologic	Don't do workup for clotting disorder (order hyper-coagulable testing) for patients who develop first episode of DVT in the setting of a known cause. *Society for Vascular Medicine*	Lab tests to look for a clotting disorder will not alter treatment of a venous blood clot, even if an abnormality is found. DVT is a very common disorder, and recent discoveries of clotting abnormalities have led to increased testing without proven benefit.	Dalen JE. Should patients with venous thromboembolism be screened for thrombophilia? Am J Med. 2008;121(6):458-63. Baglin T, et al. Incidence of recurrent venous thromboembo-lism in relation to clinical and thrombophilic risk factors: prospective cohort study. Lancet. 2003;362:523-6. Ho WK, et al. Risk of recurrent venous thromboembolism in patients with common thrombophilia. Arch Intern Med. 2006;166:729-36. Baglin T, et al. Clinical guidelines for testing for heritable thrombophilia. Br J Haematol. 2010;149:209-20.	Prospective cohort studies
Hematologic	Don't reimage DVT in the absence of a clinical change. *Society for Vascular Medicine*	Repeat ultrasound images to evaluate "response" of venous clot to therapy does not alter treatment.	Bates SM, et al. Diagnosis of DVT antithrombotic therapy and prevention of thrombosis, 9th ed. American College of Chest Physicians evidence-based clinical practice guidelines. Chest. 2012;141(2 suppl):e351S-418S.	ACCP guideline
Hematologic	Don't administer packed red blood cells in a young healthy patient without ongoing blood loss and hemoglobin of ≥ 6 g/dL unless symptomatic or hemodynamically unstable. *American Society of Anesthesiologists*	The hemoglobin transfusion threshold used in multiple studies has varied from 6.0 to 10.0 g/dL. The optimal hemoglobin/hematocrit criterion for transfusion remains controversial in several clinical settings. Nevertheless, compared with higher hemoglobin thresholds, a lower hemoglobin threshold is associated with fewer red blood cell units transfused without adverse associations with mortality, cardiac morbidity, functional recovery, or length of hospital stay. Hospital mortality remains lower in patients randomized to a lower hemoglobin	American Society of Anesthesiologists Task Force on Perioperative Blood Transfusion and Adjuvant Therapies. Practice guidelines for perioperative blood transfusion and adjuvant therapies. Anesthesiology. 2006 Jul;105(1):198-208. Carson JL, Carless PA, Hebert PC. Outcomes using lower versus higher hemoglobin thresholds for red blood cell transfusion. JAMA. 2013;309(1):83-4. Carson JL, Patel MS. (2013). Is there an optimal perioperative hemoglobin level? In: Fleisher L. Evidence-based practice of anesthesiology (3rd ed., pp. 155–163). Philadelphia (PA): Elsevier Saunders.	Cochrane Database of Systematic Reviews

		threshold for transfusion versus those randomized to a higher hemoglobin threshold. The decision to transfuse should be based on a combination of both clinical and hemodynamic parameters.	Goodnough LT, Levy JH, Murphy MF. Concepts of blood transfusion in adults. Lancet. 2013;381(9880):1845-54. Carson JL, Carless PA, Hebert PC. Transfusion threshold and other strategies for guiding allogeneic red blood cell transfusion. Cochrane Database Syst Rev. 2012;4:CD002042. Bittencourt R, Costa J, Lobo JE, Aquiar FC. Consciously transfusion of blood products. Systematic review of indicative factors for blood components infusion trigger. Rev Bras Anestesiol. 2012;62(3):402-10. Carson JL, Grossman BJ, Kleinman S, Tinmouth AT, Marques MB, Fung MK, Holcomb JB, Illoh O, Kaplan LJ, Katz LM, Rao SV, Roback JD, Shander A, Tobian AA, Weinstein R, Swinton-McLaughlin LG, Djulbegovic B, Clinical Transfusion Medicine Committee of the AABB. Red blood cell transfusion: a clinical perspective guideline from the AABB. Ann Intern Med. 2012;157(1):49-58. Toy P, Feiner J, Viele MK, Watson J, Yeap H, Weiskopf RB. Fatigue during acute isovolemic anemia in healthy resting humans. Transfusion. 2000;40(4):457–60.	
Hematologic	Don't transfuse more than the minimum number of red blood cell units necessary to relieve symptoms of anemia or to return a patient to a safe hemoglobin range (7 to 8 g/dL in stable, noncardiac inpatients). *American Society of Hematology*	Transfusion of the smallest effective dose of red blood cells is recommended because liberal transfusion strategies do not improve outcomes when compared to restrictive strategies. Unnecessary transfusion generates costs and exposes patients to potential adverse effects without any likelihood of benefit. Clinicians are urged to avoid the routine administration of two units of red blood cells if one unit is sufficient and to use appropriate weight-based dosing of red blood cells in children.	Carson JL, Grossman BJ, Kleinman S, Tinmouth AT, Marques MB, Fung MK, Holcomb JB, Illoh O, Kaplan LJ, Katz LM, Rao SV, Roback JD, Shander A, Tobian AA, Weinstein R, Swinton McLaughlin LG, Djulbegovic B; Clinical Transfusion Medicine Committee of the AABB. Red blood cell transfusion: a clinical practice guideline from the AABB. Ann Intern Med. 2012 Jul 3;157(1):49-58. Retter A, Wyncoll D, Pearse R, Carson D, McKechnie S, Stanworth S, Allard S, Thomas D, Walsh T; British Committee for Standards in Hematology. Guidelines on the management of anaemia and red cell transfusion in adult critically ill patients. Br J Haematol. 2013 Feb;160(4):445-64.	AABB guideline
Hematologic	Don't test for thrombophilia in adult patients with VTE occurring in the setting of major transient risk factors (surgery, trauma, or prolonged immobility).	Thrombophilia testing is costly and can result in harm to patients if the duration of anticoagulation is inappropriately prolonged or if patients are incorrectly labeled as thrombophilic. Thrombophilia testing does not change the management of VTEs occurring in the setting of major transient VTE risk factors. When VTE occurs in the setting of pregnancy or hormonal therapy, or when there is a strong	Chong LY, Fenu E, Stansby G, Hodgkinson S. Management of venous thromboembolic diseases and the role of thrombophilia testing: summary of NICE guidance. BMJ. 2012 Jun 27;344:e3979. Baglin T, Gray E, Greaves M, Hunt BJ, Keeling D, Machin S, Mackie I, Makris M, Nokes T, Perry D, Tait RC, Walker I, Watson H; British Committee for Standards in Hematology. Clinical guidelines for testing for heritable thrombophilia. Br J Haematol. 2010 Apr;149(2):209-20.	NICE guideline

	American Society of Hematology	family history plus a major transient risk factor, the role of thrombophilia testing is complex and patients and clinicians are advised to seek guidance from an expert in VTE.		
Hematologic	Don't administer plasma or prothrombin complex concentrates for nonemergent reversal of vitamin K antagonists (i.e., outside of the setting of major bleeding, intracranial hemorrhage, or anticipated emergent surgery). *American Society of Hematology*	Blood products can cause serious harm to patients, are costly, and are rarely indicated in the reversal of vitamin K antagonists. In nonemergent situations, elevations in the international normalized ratio are best addressed by holding the vitamin K antagonist and/or by administering vitamin K.	Holbrook A, Schulman S, Witt DM, Vandvik PO, Fish J, Kovacs MJ, Svensson PJ, Veenstra DL, Crowther M, Guyatt GH; American College of Chest Physicians. Evidence-based management of anticoagulant therapy: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. Chest. 2012 Feb;141(2 Suppl):e152S-84S. Scottish Intercollegiate Guidelines Network (SIGN). Antithrombotics: indications and management. Edinburgh (UK): 2012. 75 p. Report No. 129.	ACCP guideline
Hematologic	Don't order diagnostic tests at regular intervals (such as every day), but rather in response to specific clinical questions. *Critical Care Societies Collaborative–Critical Care [Societies: American Association of Critical-Care Nurses, American College of Chest Physicians, American Thoracic Society, and Society of Critical Care Medicine]*	Many diagnostic studies (including chest radiographs, arterial blood gases, blood chemistries and counts and electrocardiograms) are ordered at regular intervals (e.g., daily). Compared with a practice of ordering tests only to help answer clinical questions, or when doing so will affect management, the routine ordering of tests increases health care costs, does not benefit patients and may in fact harm them. Potential harms include anemia due to unnecessary phlebotomy, which may necessitate risky and costly transfusion, and the aggressive work-up of incidental and nonpathological results found on routine studies.	Flabouris A, Bishop G, Williams L, Cunningham M. Routine blood test ordering for patients in intensive care. Anaesth Intensive Care. 2000;28(5):562–5. Ganapathy A, Adhikari NKJ, Spiegelman J, Scales DC. Routine chest x-rays in intensive care units: A systematic review and meta-analysis. Crit Care. 2012;16(2):R68. May TA, Clancy M, Critchfield J, Ebeling F, Enriquez A, Gallagher C, Genevro J, Kloo J, Lewis P, Smith R, Ng VL. Reducing unnecessary inpatient laboratory testing in a teaching hospital. Am J Clin Pathol. 2006;126(2):200–6.	Expert consensus
Hematologic	Don't transfuse red blood cells in hemodynamically stable, non-bleeding intenstive care unit	Most red blood cell transfusions in the intensive care unit are for benign anemia rather than acute bleeding that causes hemodynamic compromise. For all patient populations in which it has been studied, transfusing red blood	Corwin HL, Gettinger A, Pearl RG, Fink MP, Levy MM, Abraham E, MacIntyre NR, Shabot MM, Duh MS, Shapiro MJ. The CRIT Study: anemia and blood transfusion in the critically ill – current clinical practice in the United States. Crit Care Med. 2004;32(1):39–52. Carson JL, Terrin ML, Noveck H, Sanders DW, Chaitman BR, Rhoads	RCTs

	patients with a hemoglobin concentration greater than 7 mg/dL. *Critical Care Societies Collaborative–Critical Care* *[Societies: American Association of Critical-Care Nurses, American College of Chest Physicians, American Thoracic Society, and Society of Critical Care Medicine]*	cells at a threshold of 7 mg/dL is associated with similar or improved survival, fewer complications and reduced costs compared to higher transfusion triggers. More aggressive transfusion may also limit the availability of a scarce resource. It is possible that different thresholds may be appropriate in patients with acute coronary syndromes, although most observational studies suggest harms of aggressive transfusion even among such patients.	GG, Nemo G, Dragert K, Beaupre L, Hildebrand K, Macaulay W, Lewis C, Cook DR, Dobbin G, Zakriya KJ, Apple FS, Horney RA, Magaziner J; FOCUS Investigators. Liberal or restrictive transfusion in high-risk patients after hip surgery. N Eng J Med. 2011;365(26):2453–62. Hajjar LA, Vincent JL, Galas F, Nakamura RE, Silva CM, Santos MH, Fukushima J, Kalil Filho R, Sierra DB, Lopes NH, Mauad T, Roquim AC, Sundin MR, Leão WC, Almeida JP, Pomerantzeff PM, Dallan LO, Jatene FB, Stolf NA, Auler JO Jr. Transfusion requirements after cardiac surgery: the TRACS randomized controlled trial. JAMA-JAMA. 2010;304(14):1559–67. Hebert PC, Wells G, Blajchman MA, Marshall J, Martin C, Pagliarello G, Tweeddale M, Schweitzer I, Yetisir E. A multicenter, randomized, controlled clinical trial of transfusion requirements in critical care. N Eng J Med. 1999;340(6):409–17. Villanueva C, Colomo A, Bosch A, Concepción M, Hernandez-Gea V, Aracil C, Graupera I, Poca M, Alvarez-Urturi C, Gordillo J, Guarner-Argente C, Santaló C, Muñiz E, Guarner C. Transfusion strategies for acute upper gastrointestinal bleeding. N Eng J Med. 2013;368:11–21. Chatterjee S, Wetterslev J, Sharma A, Lichstein E, Mukherjee D. Association of blood transfusion with increased mortality in myocardial infarction. JAMA.2013;173:132–39.	
Hematologic	Don't transfuse more units of blood than absolutely necessary. *AABB*	Each unit of blood carries risks. A restrictive threshold (7.0 to 8.0 g/dL) should be used for the vast majority of hospitalized, stable patients without evidence of inadequate tissue oxygenation (evidence supports a threshold of 8.0 g/dL in patients with pre-existing cardiovascular disease). Transfusion decisions should be influenced by symptoms and hemoglobin concentration. Single unit red cell transfusions should be the standard for non-bleeding, hospitalized patients. Additional units should only be prescribed after re-assessment of the patient and their hemoglobin value.	Carson JL, Grossman BJ, Kleinman S, Tinmouth AT, Marques MB, Fung MK, Holcomb JB, Illoh O, Kaplan LJ, Katz LM, Rao SV, Roback JD, Shander A, Tobian AA, Weinstein R, Swinton McLaughlin LG, Djulbegovic B; Clinical Transfusion Medicine Committee of the AABB. Red blood cell transfusion: a clinical practice guideline from the AABB. Ann Intern Med. 2012 Jul 3;157(1):49–58.	RCTs
Hematologic	Don't transfuse red blood cells for iron deficiency without hemodynamic instability.	Blood transfusion has become a routine medical response despite cheaper and safer alternatives in some settings. Preoperative patients with iron deficiency and patients with chronic iron deficiency without hemodynamic instability (even with low hemoglobin levels)	AABB. Guidelines for patient blood management and blood utilization. Bethesda (MD): AABB; 2011; 52. Lin DM, Lin ES, Tran MH. Efficacy and safety of erythropoietin and intravenous iro n in perioperative blood management: a systematic	Systematic review

	AABB	should be given oral and/or intravenous iron.	review. Transfus Med Rev. 2013 Oct;27(4):221–34. Friedman AJ, Chen Z, Ford P, Johnson CA, Lopez AM, Shander A, Waters JH, van Wyck D. Iron deficiency anemia in women across the life span. J Womens Health (Larchmt). 2012 Dec;21(12):1282–9.	
Hematologic	Don't routinely use blood products to reverse warfarin. *AABB*	Patients requiring reversal of warfarin can often be reversed with vitamin K alone. Prothrombin complex concentrates or plasma should only be used for patients with serious bleeding or requiring emergency surgery.	Holbrook A, Schulman S, Witt DM, Vandvik PO, Fish J, Kovacs MJ, Svensson PJ, Veenstra DL, Crowther M, Guyatt GH; American College of Chest Physicians. Evidence-based management of anticoagulant therapy: antithrombotic therapy and prevention of thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. Chest. 2012 Feb;141(2 Suppl):e152S–84S.	ACCP guideline
Hematologic	Don't perform serial blood counts on clinically stable patients. *AABB*	Transfusion of red blood cells or platelets should be based on the first laboratory value of the day unless the patient is bleeding or otherwise unstable. Multiple blood draws to recheck whether a patient's parameter has fallen below the transfusion threshold (or unnecessary blood draws for other laboratory tests) can lead to excessive phlebotomy and unnecessary transfusions.	Napolitano LM, Kurek S, Luchette FA, Corwin HL, Barie PS, Tisherman SA, Hebert PC, Anderson GL, Bard MR, Bromberg W, Chiu WC, Cipolle MD, Clancy KD, Diebel L, Hoff WS, Hughes KM, Munshi I, Nayduch D, Sandhu R, Yelon JA; American College of Critical Care Medicine of the Society of Critical Care Medicine; Eastern Association for the Surgery of Trauma Practice Management Workgroup. Clinical practice guideline: red blood cell transfusion in adult trauma and critical care. Crit Care Med. 2009 Dec;37(12):3124–57.	ACCCM guideline
Hematologic	Don't transfuse O negative blood except to O negative patients and in emergencies for women of child bearing potential with unknown blood group. *AABB*	O negative blood units are in chronic short supply due in part to overutilization for patients who are not O negative. O negative red blood cells should be restricted to: (1) O negative patients; or (2) women of childbearing potential with unknown blood group who require emergency transfusion before blood group testing can be performed.	The Chief Medical Officer's National Blood Transfusion Committee (UK). The appropriate use of group O RhD negative red cells. Manchester (UK): National Health Service; 2008; 4.	Expert consensus
Hematologic	Don't recommend bed rest following diagnosis of acute DVT after the initiation of anti-coagulation therapy, unless significant medical concerns are present. *American Physical*	Given the clinical benefits and lack of evidence indicating harmful effects of ambulation and activity, both are recommended following achievement of anticoagulation goals unless there are overriding medical indications. Patients can be harmed by prolonged bed rest that is not medically necessary.	Aissaoui N, Martins E, Mouly S, Weber S, Meune C. A meta-analysis of bed rest versus early ambulation in the management of pulmonary embolism, deep vein thrombosis, or both. Int J Cardiol. 2009;137(1):37–41. Anderson CM, Overend TJ, Godwin J, Sealy C, Sunderji A. Ambulation after deep vein thrombosis: a systematic review. Physiother Can. 2009;61(3):133–40. Gay V, Hamilton R, Heiskell S, Sparks AM. Influence of bedrest or ambulation in the clinical treatment of acute deep vein thrombosis on patient outcomes: a review and synthesis of the literature. Medsurg	Systematic reviews

	Therapy Association		Nurs. 2009;18(5):293–99. Kahn SR, Shrier I, Kearon C. Physical activity in patients with deep venous thrombosis: a systematic review. Thromb Res. 2008;122(6):763–73.	
Hematologic	Don't treat with an anticoagulant for more than three months in a patient with a first VTE occurring in the setting of a major transient risk factor. *American Society of Hematology*	Anticoagulation is potentially harmful and costly. Patients with a first VTE triggered by a major, transient risk factor such as surgery, trauma, or an intravascular catheter are at low risk for recurrence once the risk factor has resolved and an adequate treatment regimen with anticoagulation has been completed. Evidence-based and consensus guidelines recommend three months of anticoagulation over shorter or longer periods of anticoagulation in patients with VTE in the setting of a reversible provoking factor. By ensuring a patient receives an appropriate regimen of anticoagulation, clinicians may avoid unnecessary harm, reduce health care expenses, and improve quality of life. This Choosing Wisely recommendation is not intended to apply to VTE associated with non-major risk factors (e.g., hormonal therapy, pregnancy, travel-associated immobility), as the risk of recurrent VTE in these groups is either intermediate or poorly defined.	Kearon C, Akl EA, Comerota AJ, Prandoni P, Bounameaux H, Goldhaber SZ, Nelson ME, Wells PS, Gould MK, Dentali F, Crowther M, Kahn SR; American College of Chest Physicians. Antithrombotic therapy for VTE disease: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines [erratum appears in Chest. 2012;142(6):1698-1704]. Chest. 2012;141(2 Suppl):e419S–94S. Chalmers E, Ganesen V, Liesner R, Maroo S, Nokes T, Saunders D, Williams M; British Committee for Standards in Haematology. Guideline on the investigation, management and prevention of venous thrombosis in children. Br J Haematol. 2011;154(2):196–207. Monagle P, Chan AK, Goldenberg NA, Ichord RN, Journeycake JM, Nowak-Göttl U, Vesely SK; American College of Chest Physicians. Antithrombotic therapy in neonates and children: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. Chest. 2012;141(2 Suppl):e737S–801S.	American College of Chest Physicians guidelines
Hematologic	Don't routinely transfuse patients with sickle cell disease for chronic anemia or uncomplicated pain crisis without an appropriate clinical indication. *American Society of Hematology*	Patients with sickle cell disease are especially vulnerable to potential harms from unnecessary red blood cell transfusion. In particular, they experience an increased risk of alloimmunization to minor blood group antigens and a high risk of iron overload from repeated transfusions. Patients with the most severe genotypes of sickle cell disease with baseline hemoglobin values in the 7 to 10 g/dL range can usually tolerate further temporary reductions in Hb without developing symptoms of anemia. Many patients with sickle cell disease receive intravenous fluids to improve hydration when hospitalized for management of pain crisis, which may contribute to a	Evidence-based management of sickle cell disease: expert panel report, 2014. Washington, DC: National Institutes of Health, National Heart, Lung and Blood Institute; 2014:161. Blood transfusion guideline. Dutch Institute for Healthcare Improvement CBO; 2011:402.	National Heart, Lung and Blood Institute guidelines

		decrease in hemoglobin by 1 to 2 g/dL. Routine administration of red blood cells in this setting should be avoided. Moreover, there is no evidence that transfusion reduces pain due to vaso-occlusive crises. For a discussion of when transfusion is indicated in sickle cell disease, readers are referred to recent evidence-based guidelines from the National Heart, Lung, and Blood Institute (see references)		
Hematologic	Don't test or treat for suspected heparin-induced thrombocytopenia in patients with a low pretest probability of heparin-induced thrombocytopenia . *American Society of Hematology*	In patients with suspected heparin-induced thrombocytopenia, use the "4T's" score to calculate the pretest probability of heparin-induced thrombocytopenia. This scoring system uses the timing and degree of thrombocytopenia, the presence or absence of thrombosis, and the existence of other causes of thrombocytopenia to assess the pretest probability of heparin-induced thrombocytopenia. It can be excluded by a low pretest probability score (4T's score of 0-3) without the need for laboratory investigation. Do not discontinue heparin or start a non-heparin anticoagulant in these low-risk patients because presumptive treatment often involves an increased risk of bleeding, and because alternative anticoagulants are costly.	Watson H, Davidson S, Keeling D. Guidelines on the diagnosis and management of heparin-induced thrombocytopenia: second edition. Br J Haematol. 2012;159(5):528–40. Cuker A, Gimotty PA, Crowther MA, Warkentin TE. Predictive value of the 4Ts scoring system for heparin-induced thrombocytopenia: a systematic review and meta-analysis. Blood. 2012;120:4160–7.	Systematic review
Hematologic	Don't treat patients with immune thrombocytopenic purpura in the absence of bleeding or a very low platelet count. *American Society of Hematology*	Treatment for immune thrombocytopenic purpura should be aimed at treating and preventing bleeding episodes and improving quality of life. Unnecessary treatment exposes patients to potentially serious treatment side effects and can be costly, with little expectation of clinical benefit. The decision to treat immune thrombocytopenic purpura should be based on an individual patient's symptoms, bleeding risk (as determined by prior bleeding episodes and risk factors for bleeding such as use of anticoagulants, advanced age, high-risk activities, etc.), social factors (distance from the hospital/travel concerns), side effects of possible treatments, upcoming procedures, and	Neunert C, Lim W, Crowther M, Cohen A, Solberg L Jr., Crowther MA; American Society of Hematology. The American Society of Hematology 2011 evidence-based practice guideline for immune thrombocytopenia. Blood. 2011;117(16):4190–207.	American Society of Hematology guidelines

		patient preferences. In the pediatric setting, treatment is usually not indicated in the absence of mucosal bleeding regardless of platelet count. In the adult setting, treatment may be indicated in the absence of bleeding if the platelet count is very low. However, immune thrombocytopenic purpura treatment is rarely indicated in adult patients with platelet counts greater than 30,000/microL unless they are preparing for surgery or an invasive procedure, or have a significant additional risk factor for bleeding. In patients preparing for surgery or other invasive procedures, short-term treatment may be indicated to increase the platelet count prior to the planned intervention and during the immediate postoperative period.		
Hematologic	Don't routinely transfuse stable, asymptomatic hospitalized patients with a hemoglobin level greater than 7–8 grams. *ACOG*	Multiple factors need to be considered in transfusion decisions, including the patient's clinical status and oxygen delivery ability. Arbitrary hemoglobin or hematocrit thresholds should not be used as the only criterion for transfusions of packed red blood cells.	Carson JL, Grossman BJ, Kleinman S, Tinmouth AT, Marques MB, Fung MK, Holcomb JB, Illoh O, Kaplan LJ, Katz LM, Rao SV, Roback JD, Shander A, Tobian AA, Weinstein R, Swinton McLaughlin LG, Djulbegovic B; Clinical Transfusion Medicine Committee of the AABB. Red blood cell transfusion: a clinical practice guideline from the AABB. Ann Intern Med. 2012;157:49–58.	AABB guideline
Hematologic **Rheumatologic**	Don't order an erythrocyte sedimentation rate to look for inflammation in patients with undiagnosed conditions. Order a C-reactive protein to detect acute phase inflammation. *American Society for Clinical Pathology*	C-reactive protein is a more sensitive and specific reflection of the acute phase of inflammation than is the erythrocyte sedimentation rate. In the first 24 hours of a disease process, the C-reactive protein will be elevated, whereas the erythrocyte sedimentation rate may be normal. If the source of inflammation is removed, the C-reactive protein will return to normal within a day or so, whereas the erythrocyte sedimentation rate will remain elevated for several days until excess fibrinogen is removed from the serum.	Crowson CS, Rahman MU, Matteson EL. Which measure of inflammation to use? A comparison of erythrocyte sedimentation rate and C-reactive protein measurements from randomized clinical trials of golimumab in rheumatoid arthritis. J Rheumatol. 2009;36(8):1606-10. Wu AH, Lewandrowski K, Gronowski AM, Grenache DG, Sokoll LJ, Magnani B. Antiquated tests within the clinical pathology laboratory. Am J Manag Care. 2010;16(9):e220-7. Black S, Kushner I, Samols D. C-reactive protein. J Biol Chem. 2004:279(47):48487-90. Henriquez-Camacho C, Losa J. Biomarkers for sepsis. Biomed Res Int. 2014;2014:547818. Lelubre C, Anselin S, Zouaoui Boudjeltia K, Biston P, Piagnerelli M.	Expert consensus

			Interpretation of C-reactive protein concentrations in critically ill patients. Biomed Res Int. 2013;2013:124021.	
Hematologic	Don't test vitamin K levels unless the patient has an abnormal international normalized ratio and does not respond to vitamin K therapy. *American Society for Clinical Pathology*	Measurements of the level of vitamin K in the blood are rarely used to determine if a deficiency exists. Vitamin K deficiency is very rare, but when it does occur, a prolonged prothrombin time and elevated international normalized ratio will result. A diagnosis is typically made by observing the prothrombin time correction following administration of vitamin K, plus the presence of clinical risk factors for vitamin K deficiency.	Suttie JW. Vitamin K. In: Machlin L, ed. Handbook of Vitamins. New York, NY: Marcel Dekker; 1984:147. Van Winckel M, De Bruyne R, Van De Velde S, Van Biervliet S. Vitamin K, an update for the paediatrician. Eur J Pediatr. 2009;168(2):127-34. Shearer MJ. Vitamin K deficiency bleeding (VKDB) in early infancy. Blood Rev. 2009;23(2):49-59. Van Hasselt PM, de Koning TJ, Kvist N, de Vries E, Lundin CR, Berger R, Kimpen JL, Houwen RH, Jorgensen MH, Verkade HJ; Netherlands Study Group for Biliary Atresia Registry. Prevention of vitamin K deficiency bleeding in breastfed infants: lessons from the Dutch and Danish biliary atresia registries. Pediatrics. 2008;121(4):e857-63. Booth SL, Al Rajabi A. Determinants of vitamin K status in humans. Vitam Horm. 2008;78:1-22. Krasinski SD, Russell RM, Furie BC, Kriger SF, Jacques PF, Furie B. The prevalence of vitamin K deficiency in chronic gastrointestinal disorders. Am J Clin Nutr. 1985;41(3):639-43. Shearer MJ, Fux, Booth SL. Vitamin K nutrition, metabolism, and requirement: current concept and future research. Adv Nutr. 2012;3(2):182-95. Liebman HA, Furie BC, Tong MJ, Blanchard RA, Lo KJ, Lee SD, Coleman MS, Furie B. Des-gamma-carboxy (abnormal) prothrombin as a serum marker of primary hepatocellular carcinoma. N Engl J Med. 1984;310(22):1427-31.	Expert consensus

Topic area(s)	Recommendation	Rationale and comments	References	Source
Infectious disease	Antibiotics should not be used for apparent viral respiratory illnesses (sinusitis, pharyngitis, bronchitis). *American Academy of*	Although overall antibiotic subscription rates for children have fallen, they still remain alarmingly high. Unnecessary medication use for viral respiratory illnesses can lead to antibiotic resistance and contributes to higher health care costs and the risks of adverse events.	American Academy of Pediatrics Subcommittee on Diagnosis and Management of Bronchiolitis. Diagnosis and management of bronchiolitis. Pediatrics. 2006;118(4):1774-93. Kelly LF. Pediatric cough and cold preparations. 2004;25(4): 115-23. O'Brien KL, et al. Cough illness/bronchitis–principles of judicious use of antimicrobial agents. Pediatrics. 1998;101 (suppl):178-81. Shulman ST, et al. Clinical practice guideline for the diagnosis and	AAP, IDSA guidelines

	Pediatrics		management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. Clin Infect Dis. 2012;55(10):e86-102. Williamson IG, et al. Antibiotics and topical nasal steroids for treatment of acute maxillary sinusitis: a randomized controlled trial. JAMA. 2007;298(21):2487-96.	
Infectious disease	Avoid unnecessary CD4 tests. *HIV Medicine Association*	A CD4 count is not required in conjunction with every viral load test. Viral load testing is a better indicator of a patient's response to therapy. CD4 monitoring is not necessary for patients who have stable viral suppression. For the first two years after treatment initiation, the CD4 count should be monitored every three to six months. After two years, if the viral load is undetectable, the CD4 count should be measured yearly if it is 300–500 cells/mm^3. If it is consistently above 500 cells/mm^3 then further monitoring is optional.	Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. Department of Health and Human Services. Available at http://www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf. 2015 Apr. 288 p. Ahn JY, Boettiger D, Law M, Kumarasamy N, Yunihastuti E, Chaiwarith R, Lee MP, Sim BL, Oka S, Wong W, Kamarulzaman A, Kantipong P, Phanuphak P, Ng OT, Kiertiburanakul S, Zhang F, Pujari S, Ditangco R, Ratanasuwan W, Merati TP, Saphonn V, Sohn AH, Choi JY; TREAT Asia HIV Observational Databases (TAHOD). Implementation and operational research: effects of CD4 monitoring frequency on clinical endpoints in clinically stable HIV-infected patients with viral suppression. J Acquir Immune Defic Syndr. 2015 Jul 1;69(3):e85-92.	U.S. Department of Health and Human Services guideline
Infectious disease	Don't order complex lymphocyte panels when ordering CD4 counts. *HIV Medicine Association*	Order only CD4 counts and percentages rather than ordering other lymphocyte panels. For example, CD8 testing, including the CD4/CD8 ratio, adds cost without providing useful information. More complex lymphocyte panels are unnecessary and increase costs even more.	Aberg JA, Gallant JE, Ghanem KG, Emmanuel P, Zingman BS, Horberg MA; Infectious Diseases Society of America. Primary care guidelines for the management of persons infected with HIV: 2013 update by the HIV Medicine Association of the Infectious Diseases Society of America. Clin Infect Dis. 2014 Jan;58(1):1-10. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. Department of Health and Human Services. Available at http://www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf. 2015 Apr. 288 p.	IDSA and U.S. Department of Health and Human Services guidelines
Infectious disease	Avoid quarterly viral load testing of patients who have durable viral suppression, unless clinically indicated.	Viral load testing should be conducted before initiation of treatment, two to eight weeks after initiation or modification of therapy, and then every three to four months to confirm continuous viral suppression. In clinically stable patients who have durable virological	Aberg JA, Gallant JE, Ghanem KG, Emmanuel P, Zingman BS, Horberg MA; Infectious Diseases Society of America. Primary care guidelines for the management of persons infected with HIV: 2013 update by the HIV Medicine Association of the Infectious Diseases Society of America. Clin Infect Dis. 2014 Jan;58(1):1-10. Panel on Antiretroviral Guidelines for Adults and Adolescents.	IDSA and U.S. Department of Health and Human Services guidelines

	HIV Medicine Association	suppression for more than two years, clinicians may extend the interval to six months.[2]	Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. Department of Health and Human Services. Available at http://www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf. 2015 Apr. 288 p.	
Infectious disease	Don't routinely test for CMV immunoglobulin G in HIV-infected patients who have a high likelihood of being infected with CMV. *HIV Medicine Association*	CMV immunoglobulin G testing is recommended only in patients who are at lower risk for CMV to detect latent CMV infection. CMV immunoglobulin G testing is not necessary in patients at higher risk for CMV, including men who have sex with men and injection drug users, because they can be assumed to be CMV positive. Testing for CMV antibody in low-risk populations is recommended to foster patient counseling in avoidance of CMV infection through practicing safe sex and to avoid transfusion except with CMV-negative blood products. Patients at lower risk for CMV infection, e.g., patients who are heterosexual and have not injected drugs, should be tested for latent CMV infection with an anti–CMV immunoglobulin G upon initiation of care.	Aberg JA, Gallant JE, Ghanem KG, Emmanuel P, Zingman BS, Horberg MA; Infectious Diseases Society of America. Primary care guidelines for the management of persons infected with HIV: 2013 update by the HIV Medicine Association of the Infectious Diseases Society of America. Clin Infect Dis. 2014 Jan;58(1):1-10. Panel on Opportunistic Infections in HIV-Infected Adults and Adolescents. Guidelines for prevention and treatment of opportunistic infections in HIV-infected adults and adolescents: recommendations from the Centers for Disease Control and Prevention, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America; 2015 Apr. 414 p. Available at http://aidsinfo.nih.gov/contentfiles/lvguidelines/adult_oi.pdf.	IDSA guidelines
Infectious disease	Don't routinely order testing for glucose-6-phosphate dehydrogenase deficiency for patients who are not predisposed due to race/ethnicity. *HIV Medicine Association (HIVMA)*	Glucose-6-phosphate dehydrogenase deficiency testing is recommended upon entry into care or before starting therapy with an oxidant drug only in patients with human immunodeficiency virus (HIV) infection who are predisposed to this genetic disorder that can cause hemolytic anemia. Glucose-6-phosphate dehydrogenase deficiency most frequently occurs in populations of African, Asian, and Mediterranean descent and is most likely to affect HIV-infected patients with one of these racial or ethnic backgrounds.	Aberg JA, Gallant JE, Ghanem KG, Emmanuel P, Zingman BS, Horberg MA; Infectious Diseases Society of America. Primary care guidelines for the management of persons infected with HIV: 2013 update by the HIV Medicine Association of the Infectious Diseases Society of America. Clin Infect Dis. 2014 Jan;58(1):1-10. Prchal JT, Gregg XT. Red cell enzymes. American Society of Hematology. 2015 Aug 11;(1):19-23.	IDSA guideline
Infectious disease **Urologic** **Geriatric**	Don't use antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present.	Cohort studies have found no adverse outcomes for older men or women associated with asymptomatic bacteriuria. Antimicrobial treatment studies for asymptomatic bacteriuria in older adults demonstrate no benefits and show increased adverse antimicrobial effects.	Nordenstam GR, et al. Bacteriuria and mortality in an elderly population. N Engl J Med. 1986;314(18):1152-6. Nicolle LE, et al. Prospective randomized comparison of therapy and no therapy for asymptomatic bacteriuria in institutionalized elderly women. Am J Med. 1987;83(1):27-33.	IDSA guideline

	American Geriatrics Society	Consensus criteria have been developed to characterize the specific clinical symptoms that, when associated with bacteriuria, define urinary tract infection. Screening for and treatment of asymptomatic bacteriuria is recommended before urologic procedures for which mucosal bleeding is anticipated.	Juthani-Mehta M. Asymptomatic bacteriuria and urinary tract infection in older adults. Clin Geriatr Med. 2007;23:585-94. Nicolle LE, et al. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. Clin Infect Dis. 2005;40(5):643-5.	
Infectious disease **Urologic**	Don't obtain a urine culture unless there are clear signs and symptoms that localize to the urinary tract. *American Medical Directors Association*	Chronic asymptomatic bacteriuria is frequent in the long-term care setting, with prevalence as high as 50%. A positive urine culture in the absence of localized urinary tract infection (UTI) symptoms (i.e., dysuria, frequency, urgency) is of limited value in identifying whether a patient's symptoms are caused by a UTI. Colonization (a positive bacterial culture without signs or symptoms of a localized UTI) is a common problem in long-term care facilities that contributes to the overuse of antibiotic therapy in this setting, leading to an increased risk of diarrhea, resistant organisms and infection due to *Clostridium difficile*. An additional concern is that the finding of asymptomatic bacteriuria may lead to an erroneous assumption that a UTI is the cause of an acute change of status, hence failing to detect or delaying the more timely detection of the patient's more serious underlying problem. A patient with advanced dementia may be unable to report urinary symptoms. In this situation, it is reasonable to obtain a urine culture if there are signs of systemic infection such as fever (increase in temperature of equal to or greater than 2°F [1.1°C] from baseline) leukocytosis, or a left shift or chills in the absence of additional symptoms (e.g., new cough) to suggest an alternative source of infection.	Stone ND, Ashraf MS, Calder J, Crnich CJ, Crossley K, Drinka PJ, Gould CV, Juthani-Mehta M, Lautenbach E, Loeb M, MacCannell T, Malani TN, Mody L, Mylotte JM, Nicolle LE, Roghmann MC, Schweon SJ, Simor AE, Smith PW, Stevenson KB, Bradley SF. Surveillance definitions of infections in long-term care facilities: revisiting the McGeer Criteria. Infec Control Hosp Epidemiol. 2012;33(10):965-77. Drinka P. Treatment of bacteriuria without urinary signs, symptoms, or systemic infectious illness (S/S/S). J Am Med Dir Assoc. 2009 Oct;10(8):516-9. Arinzon Z, Peisakh A, Shuval I, Shabat S, Berner YN. Detection of urinary tract infection (UTI) in long-term care setting: is the multireagent strip an adequate diagnostic tool? Arch Gerontol Geriatr. 2009 Mar-Apr;48(2):227-31. High KP, Bradley SF, Gravenstein S, Mehr DR, Quagliarello VJ Richards C, Yoshikawa TT. Clinical practice guideline for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Diseases Society of America. J Am Geriatr Soc. 2009 Mar;57(3):375-94. Zabarsky TF, Sethi AK, Donskey CJ. Sustained reduction in inappropriate treatment of asymptomatic bacteriuria in a long-term care facility through an educational intervention. Am J Infect Control. 2008 Sep;36(7):476-80. Richards CL Jr. Infection control in long-term care facilities. J Am Med Dir Assoc. 2007 Mar;8(3 Suppl):S18-25. Ducharme J, Neilson S, Ginn JL. Can urine cultures and reagent test strips be used to diagnose urinary tract infection in elderly emergency department patients without focal urinary symptoms? CJEM. 2007 Mar;9(2):87-92. Loeb M, Brazil K, Lohfeld L, McGeer A, Simor A, Stevenson K, Zoutman D, Smith S, Liu X, Walter SD. Effect of a multifaceted intervention on number of antimicrobial prescriptions for suspected urinary tract infections in residents of nursing homes: cluster	IDSA guideline

			randomized controlled trial. BMJ. 2005 Sep 24;331(7518):669. Loeb M, Brazil K, Lohfeld L, McGeer A, Simor A, Stevenson K, Walter S, Zoutman D. Optimizing antibiotics in residents of nursing homes: protocol of a randomized trial. BMC Health Serv Res. 2002 Sep 3;2(1):17. Nicolle LE. Urinary tract infection in geriatric and institutionalized patients. Curr Opin Urol. 2002 Jan;12(1):51-5. Boscia JA, Kobasa WD, Abrutyn E, Levison ME, Kaplan AM, Kaye D. Lack of association between bacteriuria and symptoms in the elderly. Am J Med. 1986 Dec;81(6):979-82. Nicolle LE, Bentley D, Garibaldi R, Neuhaus E, Smith P. SHEA Long-Term Care Committee. Antimicrobial use in long-term-care facilities. Infect Control Hosp Epidemiol. 1996;17:119-28. High KP, Bradley SF, Gravenstein S, Mehr DR, Quagliarello VJ, Richards C, Yoshikawa TT. Clinical practice guideline for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Diseases Society of America. Clin Infect Dis 2009;48:149-71.	
Infectious disease **Emergency medicine**	Avoid antibiotics and wound cultures in emergency department patients with uncomplicated skin and soft tissue abscesses after successful incision and drainage and with adequate medical follow-up. *American College of Emergency Physicians*	Skin and soft tissue infections are a frequent reason for visiting an emergency department. Some infections, called abscesses, become walled off and form pus under the skin. Opening and draining an abscess is the appropriate treatment; antibiotics offer no benefit. Even in abscesses caused by methicillin-resistant *Staphylococcus aureus*, appropriately selected antibiotics offer no benefit if the abscess has been adequately drained and the patient has a well-functioning immune system. Additionally, culture of the drainage is not needed as the result will not routinely change treatment.	Baumann BM, Russo CJ, Pavlik D, Cassidy-Smith T, Brown N, Sacchetti A, Capano-Wehrle LM, Mistry RD. Management of pediatric skin abscesses in pediatric, general academic and community emergency departments. West J Emerg Med. 2011May;12(2):159-67. Duong M, Markwell S, Peter J, Barenkamp S. Randomized, controlled trial of antibiotics in the management of community-acquired skin abscesses in the pediatric patient. Ann Emerg Med. 2010 May;55(5):401-7. Llera JL, Levy RC. Treatment of cutaneous abscess: a double-blind clinical study. Ann Emerg Med. 1985;14:15-9. Niska R, Bhuiya F, Xu J. National Hospital Ambulatory Medical Care Survey: 2007 Emergency Department Summary. National health statistics reports. Hyattsville, [MD]: National Center for Health Statistics. 2010. 31 p. Report no.: 26.	RCTs
Infectious Disease **Allergy and Immunologic**	Don't overuse non-beta lactam antibiotics in patients with a history of penicillin allergy, without an appropriate evaluation.	While about 10% of the population reports a history of penicillin allergy, studies show that 90% on more of these patients are not allergic to penicillins and are able to take these antibiotics safely. The main reason for this observation is that penicillin allergy is often misdiagnosed and when present wanes over	Solensky R, Khan DA. Drug allergy: an updated parameter. Ann Allergy Asthma Immunol. 2010 Oct;105(4):259–73. Solensky R. Penicillin allergy as a public health measure. J Allergy Clin Immunol. 2013 Dec 8. pii:S0091-6749(13)01646–1. Macy E, Contreras R. Healthcare utilization and serious infection	Expert consensus

	American Academy of Allergy, Asthma & Immunology	time in most (but not all) individuals. Patients labeled penicillin-allergic are more likely to be treated with alternative antibiotics (such as vancomycin and quinolones), have higher medical costs, experience longer hospital stays, and are more likely to develop complications such as infections with vancomycin-resistant enterococcus and *Clostridium difficile*. Evaluation for specific IgE to penicillin can be carried out by skin testing. Ideally, penicillin skin testing should be performed with both major and minor determinants. The negative predictive value of penicillin skin testing for immediate reactions approaches 100%, whereas the positive predictive value is between 40 and 100%. The usefulness of in vitro tests for penicillin-specific IgE is limited by their uncertain predictive value. They are not suitable substitutes for penicillin skin testing. By identifying the overwhelming majority of individuals who can safely receive penicillin and penicillin-like drugs, we can improve the appropriateness of antibiotic therapy and clinical care outcomes.	prevalence associated with penicillin "allergy" in hospitalized patients: a cohort study. J Allergy Clin Immunol. 2013 Nov 1. pii:S0091–6749(13)01467–X. Park MA, Markus PJ, Matesic D, Li JTC. Safety and effectiveness of a preoperative allergy clinic in decreasing vancomycin use in patients with a history of penicillin allergy. Ann Allergy Asthma Immunol. 2006;97:681–7.	
Infectious Disease	Avoid the use of surveillance cultures for the screening and treatment of asymptomatic bacteruria. *American Academy of Pediatrics*	There is minimal evidence that surveillance urine cultures or treatment of asymptomatic bacteruria is beneficial. Surveillance cultures are costly and produce both false-positive and false-negative results. Treatment of asymptomatic bacteruria also increases exposure to antibiotics, which is a risk factor for subsequent infections with a resistant organism. This also results in the overall use of antibiotics in the community and may lead to unnecessary imaging.	Conway PH, Cnaan A, Zaoutis T, Henry BV, Grundmeier RW, Keren R. Recurrent urinary tract infections in children: risk factors and association with prophylactic antimicrobials. JAMA. 2007 Jul 11;298(2):179–86. Kemper KJ, Avner ED. The case against screening urinalysis for asymptomatic bacteruria in children. Am J Dis Child. 1992 Mar;146(3):343–6. Nicolle LE. Asymptomatic bacteruria: when to screen and when to treat. Infect Dis Clin North Am. 2003 Jun;17(2):367–94. Roberts KB; American Academy of Pediatrics Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement and Management. Urinary tract infection: clinical practice guideline for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. Pediatrics. 2011 Sep;128(3):595–610.	AAP guideline

Infectious Disease **Sports Medicine**	Avoid ordering an abdominal ultrasound examination routinely in athletes with infectious mononucleosis. *American Medical Society for Sports Medicine*	Splenic enlargement is common in patients with infectious mononucleosis. The spleen is at increased risk for splenic rupture in the first 3 to 4 weeks of infection. This has led many clinicians to utilize ultrasound to determine if splenic enlargement is present. However, because individual splenic diameters vary greatly, comparing splenic size to population norms is not a valid method to assess splenic enlargement.	Putukian M, O'Connor FG, Stricker P, McGrew C, Hosey RG, Gordon SM, Kinderknecht J, Kriss V, Landry G. Mononucleosis and athletic participation: an evidence-based subject review. Clin J Sport Med. 2008 Jul;18(4):309–15. Spielmann AL, DeLong DM, Kliewer MA. Sonographic evaluation of spleen size in tall healthy athletes. Am J Roentgenol. 2005 Jan;184(1):45–9. Hosey RG, Mattacola CG, Kriss V, Armsey T, Quarles JD, Jagger J. Ultrasound assessment of spleen size in collegiate athletes. Br J Sports Med. 2006 Mar;40(3):251–4.	Expert consensus
Infectious disease **Urologic**	Don't treat asymptomatic bacteruria with antibiotics. *Infectious Diseases Society of America*	Inappropriate use of antibiotics to treat asymptomatic bacteruria, or a significant number of bacteria in the urine that occurs without symptoms such as burning or frequent urination, is a major contributor to antibiotic overuse in patients. With the exception of pregnant patients, patients undergoing prostate surgery or other invasive urological surgery, and kidney or kidney pancreas organ transplant patients within the first year of receiving the transplant, use of antibiotics to treat asymptomatic bacteruria is not clinically beneficial and does not improve morbidity or mortality. The presence of a urinary catheter increases the risk of bacteruria; however, antibiotic use does not decrease the incidence of symptomatic catheter-associated urinary tract infection, and unless there are symptoms referable to the urinary tract or symptoms with no identifiable cause, catheter-associated asymptomatic bacteruria does not require screening and antibiotic therapy. The overtreatment of asymptomatic bacteruria with antibiotics is not only costly, but can lead to *Clostridum difficile* infection and the emergence of resistant pathogens, raising issues of patient safety and quality.	Trautner B, Kelly PA, Petersen N, Hysong S, Kell H, Liao KS, Patterson JE, Naik AN. A hospital-site controlled intervention using audit and feedback to implement guidelines concerning inappropriate treatment of catheter-associated asymptomatic bacteriuria. Implement Sci. 2011;6:41. Nicolle LE, Bradley S, Colgan R, Rice JC, Schaeffer A, Hooton TM. Infectious Diseases Society of America, American Society of Nephrology, American Geriatric Society. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. Clin Infect Dis. 2005;40(5):643-54. Gross PA, Patel B. Reducing antibiotic overuse: a call for a national performance measure for not treating asymptomatic bacteriuria. Clin Infect Dis. 2007;45(10):1335-7.	Infectious Diseases Society of America guideline
Infectious disease	Avoid prescribing antibiotics for upper	The majority of acute upper respiratory infections are viral in etiology, and the use of	Chow AW, Benninger MS, Brook I, Brozek JL, Goldstein EJ, Hicks LA, Pankey GA, Seleznick M, Volturo G, Wald ER, File TM Jr. IDSA	Infectious Diseases

	respiratory infections. *Infectious Diseases Society of America*	antibiotic treatment is ineffective, inappropriate, and potentially harmful. However, proven infection by Group A Streptococcal disease (Strep throat) and pertussis (whooping cough) should be treated with antibiotic therapy. Symptomatic treatment for upper respiratory infections should be directed to maximize relief of the most prominent symptom(s). It is important that health care providers have a dialogue with their patients and provide education about the consequences of misusing antibiotics in viral infections, which may lead to increased costs, antimicrobial resistance, and adverse effects.	clinical practice guideline for acute bacterial rhinosinusitis in children and adults. Clin Infect Dis. 2012;54(8):e72-112. Zoorod R, Sidani MA, Fremont RD, Kihlberg C. Antibiotic use in acute upper respiratory tract infections. Am Fam Physician. 2012;86(9):817-22. Adult appropriate antibiotic use summary: physician information sheet (adults) [Internet].Atlanta (GA): The Centers for Disease Control and Prevention; 2012 May 1 [updated 2012 Jun 25; cited 2015 Jan 28]. Available from: http://www.cdc.gov/getsmart/campaign-materials/info-sheets/adult-approp-summary.html.	Society of America guideline
Infectious disease **Gastro-enterologic**	Don't obtain a *Clostridium difficile* toxin test to confirm "cure" if symptoms have resolved. *The Society for Post-Acute and Long-Term Care Medicine*	Rates of *C. difficile* infection have been increasing, especially among older adults who have recently been hospitalized or who reside in the post-acute and long-term care setting. Patients residing in post-acute and long-term care facilities are particularly at risk for *C. difficile* infection because of advanced age, frequent hospitalizations and frequent antibiotic exposure. Studies show that up to 57% of patients in the post-acute and long-term care setting are asymptomatic carriers of *C. difficile*. Furthermore, studies have also shown that *C. difficile* tests may remain positive for as long as 30 days after symptoms have resolved. False positive "test-of-cure" specimens may complicate clinical care and result in additional courses of inappropriate anti-*C. difficile* therapy. To limit the spread of *C. difficile*, care providers in the post-acute and long-term care setting should concentrate on early detection of symptomatic patients and consistently use proper infection control practices, including hand washing with soap and water.	Riggs MM, Sethi AK, Zabarsky TF, Eckstein EC, Jump RL, Donskey CJ. Asymptomatic carriers are a potential source for transmission of epidemic and nonepidemic *Clostridium difficile* strains among long-term care facility residents. Clin Infect Dis. 2007 Oct 15;45 (8):992. Surawicz CM, Brandt LJ, Binion DG, Ananthakrishnan AN, Curry SR, Gilligan PH, McFarland LV, Mellow M, Zuckerbraun BS. Guidelines for diagnosis, treatment, and prevention of *Clostridium difficile* infections. Am J Gastroenterol. 2013 Apr;108(4):478–98.	Expert consensus
Infectious disease **Urologic**	Avoid using a fluoroquinolone antibiotic for the first-line treatment of	For women with uncomplicated UTIs (defined as premenopausal, non-pregnant women with no known urologic abnormalities or comorbidities), fluoroquinolone antibiotics	Gupta K, Hooton TM, Naber KG, Wullt B, Colgan R, Miller LG, Moran GJ, Nicolle LE, Raz R, Schaeffer AJ, Soper DE; Infectious Diseases Society of America; European Society for Microbiology and Infectious Diseases. International clinical practice guidelines for the	IDSA guideline

	uncomplicated UTIs in women. *American Urogynecologic Society*	should not be considered first-line treatment. Although fluoroquinolones are efficacious in three-day regimens, they have a higher risk of ecological adverse events, such as increasing multidrug resistant organisms. Thus, fluoroquinolones should only be used for the treatment of acute UTIs for women who should not be prescribed nitrofurantoin, trimethoprim-sulfamethoxazole, or fosfomycin.	treatment of acute uncomplicated cystitis and pyelonephritis in women: 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. Clin Infect Dis. 2011 Mar 1;52(5):e103-20. Hooton TM. Clinical practice. Uncomplicated urinary tract infection. N Engl J Med. 2012 Mar 15;366(11):1028-37.	

Discipline(s)	Recommendation	Rationale and comments	References	Source
Neonatology **Obstetric**	Don't separate mothers and their newborns at birth unless medically necessary. Instead, help the mother to place her newborn in skin-to-skin contact immediately after birth and encourage her to keep her newborn in her room during hospitalization after the birth. *American Academy of Nursing*	Keeping mothers and newborns together promotes maternal-infant attachment, early and sustained breastfeeding, and physiologic stability. Early initiation of skin-to-skin care and breastfeeding promotes optimal outcomes and can significantly reduce morbidity for healthy term and preterm or vulnerable newborns. Breastfeeding is the ideal form of infant nutrition and should be the societal norm. Given the numerous health benefits for infant and mother and the health care cost savings associated with breastfeeding, breastfeeding has become a global public health initiative that can improve the overall health of nations. Ideally, infants should be exclusively breastfed for the first six months of life; after the first six months, appropriate complementary foods should be introduced, and the infant should continue to breastfeed for one to two years, or longer as desired. Worldwide, the lives of an estimated 1.5 million children less than the age of five would be saved annually if all children were fed according to this standard.	Section on Breastfeeding. Breastfeeding and the use of human milk. Pediatrics. 2012 Mar;129(3):e827-41. AWHONN position statement. Breastfeeding. J Obstet Gynecol Neonatal Nurs. 2015 Jan-Feb: 44(1);145-50. Brodribb W, Kruske S, Miller YD. Baby-friendly hospital accreditation, in-hospital care practices, and breastfeeding. Pediatrics. 2013 Apr;131(4):685-92. Conde-Agudelo A, Díaz-Rossello L. Kangaroo mother care to reduce morbidity and mortality in low birth weight infants. Cochrane Database Syst Rev. 2014 Apr 22;4:CD002771. Marín Gabriel MA, Llana Martín I, López Escobar A, Fernández Villalba E, Romero Blanco I, Touza Pol P. Randomized controlled trial of early skin-to-skin contact: effects on the mother and the newborn. Acta Paediatr. 2010 Nov;99(11):1630-4. Moore ER, Anderson GC. Randomized controlled trial of very early mother-infant skin-to-skin contact and breastfeeding status. J Midwifery Womens Health. 2007 Mar-Apr;52(2):116-25. Moore ER, Anderson GC, Bergman N. Early skin-to-skin contact for mothers and their healthy newborn infants. Cochrane Database Syst Rev. 2007 Jul 18;(3):CD003519. Breastfeeding key to saving children's lives: ten steps to successful breastfeeding highlighted during World Breastfeeding Week. Geneva (Switzerland): World Health Organization. 2010 Jul 30. Available from: http://www.who.int/mediacentre/news/notes/2010/breastfeeding_20100730/en/.	Randomized controlled trials

Neonatology **Pulmonary medicine**	Don't prescribe high-dose dexamethasone (0.5mg/kg per day) for the prevention or treatment of bronchopulmonary dysplasia in preterm infants. *American Academy of Pediatrics*	High-dose dexamethasone (0.5 mg/kg day) does not appear to confer additional therapeutic benefit over lower doses and is not recommended. High doses also have been associated with numerous short- and long-term adverse outcomes, including neurodevelopmental impairment.	Watterberg KL; American Academy of Pediatrics Committee on Fetus and Newborn. Policy statement–postnatal corticosteroids to prevent or treat bronchopulmonary dysplasia. Pediatrics. 2010 Oct;126(4):800–8.	AAP guideline

Topic area(s)	Recommendation	Rationale and comments	References	Source
Nephrologic **Cardio-vascular**	Avoid NSAIDs in individuals with hypertension or heart failure or chronic kidney disease of all causes, including diabetes. *American Society of Nephrology*	The use of NSAIDS, including cyclooxygenase type 2 inhibitors, for the pharmacological treatment of musculoskeletal pain can elevate blood pressure, make antihypertensive drugs less effective, cause fluid retention, and worsen kidney function in these individuals. Other agents such as acetaminophen or tramadol, or short-term use of narcotic analgesics, may be safer than and as effective as NSAIDs.	National Kidney Foundation Kidney Disease Outcomes Quality Initiative. KDOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. http://www.kidney.org/professionals/KDOQI/guidelines_ckd/toc.htm. Chronic kidney disease in adults: UK guidelines for identification, management and referral. http://www.renal.org/ckdguide/full/ukckdfull.pdf. Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. http://www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.pdf. Scottish Intercollegiate Guidelines Network. Management of chronic heart failure. http://www.sign.ac.uk/pdf/sign95.pdf.	National Kidney Foundation Kidney Disease Outcomes Quality Initiative
Nephrologic **Cardio-vascular**	Don't screen for renal artery stenosis in patients without resistant hypertension and with normal renal function, even if known atherosclerosis is present. *Society for Vascular Medicine*	Performing surgery or angioplasty to improve circulation to the kidneys has no proven preventive benefit, and shouldn't be considered unless there is evidence of symptoms, such as elevated blood pressure or decreased renal function.	ACC/AHA 2005 practice guidelines for the management of patients with peripheral arterial disease (lower extremity, renal, mesenteric, and abdominal aortic): executive summary. Circulation. 2006;113;1474-1547.	ACC/AHA guideline

Topic area(s)	Recommendation	Rationale and comments	References	Source
Neurologic	Don't do imaging for uncomplicated	Imaging headache patients absent specific risk factors for structural disease is not likely to	Jordan JE, et al. ACR Appropriateness Criteria: headache. Reston, Va.: American College of Radiology; 2009. http://www.acr.org/~/media/ACR/Documents/AppCriteria/Diagnostic/Hea	AAN, ACR guidelines

	headache. *American College of Radiology*	change management or improve outcome. Those patients with a significant likelihood of structural disease requiring immediate attention are detected by clinical screens that have been validated in many settings. Many studies and clinical practice guidelines concur. Also, incidental findings lead to additional medical procedures and expense that do not improve patient well-being.	dache.pdf. Institute for Clinical Systems Improvement. Diagnosis and treatment of headache. Bloomington, Minn.: Institute for Clinical Systems Improvement; 2011. Frishberg BM, et al. Evidence-based guidelines in the primary care setting: neuroimaging in patients with nonacute headache. American Academy of Neurology. 2000. http://www.aan.com/professionals/practice/pdfs/gl0088.pdf. Silberstein SD. Practice parameter: evidence-based guidelines for migraine headache. Neurology. 2000;55:754. Edlow JA, et al. Clinical policy: critical issues in the evaluation and management of adult patients presenting to the emergency department with acute headache. Ann Emerg Med. 2008;52(4): 407-36.	
Neurologic	Don't perform electro-encephalography for headaches. *American Academy of Neurology*	Electroencephalography has no advantage over clinical evaluation in diagnosing headache, does not improve outcomes, and increases cost. Recurrent headache is the most common pain problem, affecting 15% to 20% of people.	American Academy of Neurology. Practice parameter: the electroencephalogram in the evaluation of headache. http://aan.com/professionals/practice/pdfs/pdf_1995_thru_1998/1995.45.1411.pdf.	AAN guideline
Neurologic **Pediatric** **Emergency medicine**	CT scans are not necessary in the evaluation of minor head injuries. *American Academy of Pediatrics*	Head injuries occur commonly in children and adolescents. Approximately 50% of children who visit hospital emergency departments with a head injury are given a CT scan, a considerable number of which are unnecessary. Unnecessary exposure to x-rays poses considerable danger to children, including increasing the lifetime risk of cancer because a child's brain tissue is more sensitive to ionizing radiation. They also impose undue costs to the health care system. Clinical observation prior to CT decision making for children with minor head injuries is an effective approach.	Dunning J, et al. A meta-analysis of variables that predict significant intracranial injury in minor head trauma. Arch Dis Child. 2004;89(7):653-9. Kuppermann N, et al. Identification of children at very low-risk of clinically-important brain injuries after head trauma: a prospective cohort study. 2009;374(9696):1160-70. Nigrovic LE, et al. The effect of observation on cranial computed tomography utilization for children after blunt head trauma. Pediatrics. 2011;127(6):1067-73. Oman JA, et al. Performance of a decision-rule to predict need for computed tomography among children with blunt head trauma. Pediatrics. 2006;117(2):e238-46.	Systematic review and meta-analysis
Neurologic **Pediatric** **Emergency medicine**	Neuroimaging (CT, MRI) is not necessary in a child with simple febrile seizure. *American Academy of Pediatrics*	CT scanning is associated with radiation exposure that may escalate future cancer risk. MRI also has associated risks from required sedation and high cost. The literature does not support the use of skull films in the evaluation of a child with a febrile seizure. Clinicians evaluating infants or young children after a simple febrile seizure should direct their attention toward identifying the cause of the	American Academy of Pediatrics Subcommittee on Febrile Seizures. Guideline for the neurodiagnostic evaluation of the child with a simple febrile seizure. Pediatrics. 2011;127(2):389-94.	AAP guideline

		child's fever.		
Neurologic	In the evaluation of simple syncope and a normal neurologic examination, don't obtain brain imaging studies (CT or MRI). *American College of Physicians*	In patients with witnessed syncope, but with no suggestion of seizure and no report of other neurologic symptoms or signs, the likelihood of a central nervous system cause of the event is extremely low and patient outcomes are not improved with brain imaging studies.	ACR-ASNR Practice guideline for the performance of computed tomography (CT). 2010. http://www.asnr.org/sites/default/files/guidelines/CT_Brain.pdf. National Institute for Health and Clinical Excellence. Transient loss of consciousness in adults and young people. August 2010. http://guidance.nice.org.uk/CG109.	ACR, NICE guidelines
Neurologic	Don't perform imaging of the carotid arteries for simple syncope without other neurologic symptoms. *American Academy of Neurology*	Occlusive carotid artery disease does not cause fainting but rather causes focal neurologic deficits such as unilateral weakness. Thus, carotid imaging will not identify the cause of the fainting and increases cost. Fainting is a frequent complaint, affecting 40% of people during their lifetime.	AHA/ACCF scientific statement on the evaluation of syncope. Circulation. 2006;113:316-27. The Task Force for the Diagnosis and Management of Syncope of the European Society of Cardiology. Guidelines for the diagnosis and management of syncope. http://www.escardio. org/guidelines-surveys/esc-guidelines/guidelinesdocuments/ guidelines-syncope-ft.pdf. National Institute for Health and Clinical Excellence. Transient loss of consciousness ("blackouts") management in adults and young people. London, U.K.: Royal College of Physicians; 2010.	AHA, NICE guidelines
Neurologic	Don't use opioids or butalbital for migraine except as a last resort. *American Academy of Neurology*	Opioid and butalbital treatment for migraine should be avoided because more effective, migraine-specific treatments are available. Frequent use of opioids and butalbital can worsen headaches. Opioids should be reserved for those with medical conditions precluding use of migraine-specific treatments or for those who fail these treatments.	U.S. Headache Consortium guidelines. http://www.american headachesociety.org/professional_resources/us_headache_consortium_guidelines/. European Federation of Neurological Societies guideline on drug treatment of migraine. http://www.efns.org/fileadmin/user_ upload/guidline_papers/EFNS_guideline_2009_drug_treatment_of_migraine.pdf. Institute for Clinical Systems Improvement. Headache, diagnosis and treatment of. https://www.icsi.org/guidelines__ more/catalog_guidelines_and_more/catalog_guidelines/catalog_neurological_guidelines/headache/.	Institute for Clinical Systems Improvement, U.S. Headache Consortium guidelines
Neurologic **Orthopedic**	Don't use electromyography (EMG) and nerve conduction studies (NCS) to determine the cause of axial lumbar, thoracic or cervical spine pain.	Electromyography and nerve conduction studies are measures of nerve and muscle function. They may be indicated when there is concern for a neurologic injury or disorder, such as the presence of leg or arm pain, numbness or weakness associated with compression of a spinal nerve. As spinal nerve injury is not a cause of neck, mid back, or low back pain, electromyography/nerve conduction	Sandoval AE. Electrodiagnostics for low back pain. Phys Med Rehabil Clin N Am. 2010 Nov;21(4):767-76. NASS Evidence-Based Guideline: North American Spine Society (NASS). Diagnosis and treatment of degenerative lumbar spinal stenosis. Burr Ridge (IL): North American Spine Society (NASS); 2011. 104 p.	Expert consensus

	North American Spine Society	studies have not been found to be helpful in diagnosing the underlying causes of axial lumbar, thoracic, and cervical spine pain.		
Neurologic	Don't perform neuroimaging studies in patients with stable headaches that meet criteria for migraine. *American Headache Society*	Numerous evidence-based guidelines agree that the risk of intracranial disease is not elevated in migraine. However, not all severe headaches are migraine. To avoid missing patients with more serious headaches, a migraine diagnosis should be made after a careful clinical history and an examination that documents the absence of any neurologic findings such as papilledema. Diagnostic criteria for migraine are contained in the International Classification of Headache Disorders.	Frishberg BM. The utility of neuroimaging in the evaluation of headache in patients with normal neurologic examination. Neurology. 1994 Jul;44(7):1191-7. Silberstein SD. Practice parameter: evidence-based guidelines for migraine headache (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology. 2000 Sep 26;55(6):754-62. Neuroimaging for the evaluation of chronic headaches: an Evidence-based analysis. Ont Health Technol Assess Ser. 2010;10(26):1-57. Headache Classification Subcommittee of the International Headache Society. International classification of headache disorders. Cephalalgia. 2004 Sep 1;4(1):1-151.	AAN guideline
Neurologic	Don't perform CT imaging for headache when MRI is available, except in emergency settings. *American Headache Society*	When neuroimaging for headache is indicated, MRI is preferred over CT, except in emergency settings when hemorrhage, acute stroke, or head trauma are suspected. MRI is more sensitive than CT for the detection of neoplasm, vascular disease, posterior fossa and cervicomedullary lesions, and high and low intracranial pressure disorders. CT of the head is associated with substantial radiation exposure, which may elevate the risk of later cancers, while there are no known biologic risks from MRI.	Neuroimaging for the evaluation of chronic headaches: an evidence-based analysis. Ont Health Technol Assess Ser. 2010;10(26):1-57. Evans R. Diagnostic testing for migraine and other primary headaches. Neurol Clin. 2009 May;27(2):393-414. Semelka RC, Armao DM, Elias J Jr, Huda W. Imaging strategies to reduce the risk of radiation in CT studies, including selective substitution with MRI. J Magn Reson Imaging. 2007;25(5):900-09. Brenner DJ, Hall EJ. Computed tomography—an increasing source of radiation exposure. N Engl J Med. 2007;357(22):2277-84.	Expert consensus
Neurologic	Don't recommend surgical deactivation of migraine trigger points outside of a clinical trial. *American Headache Society*	The value of this form of "migraine surgery" is still a research question. Observational studies and a small controlled trial suggest possible benefit. However, large multicenter, randomized controlled trials with long-term follow-up are needed to provide accurate estimates of the effectiveness and harms of surgery. Long-term side effects are unknown but potentially a concern.	Guyuron B, Kriegler JS, Davis J, Amini SB. Comprehensive surgical treatment of migraine headaches. Plast Reconstr Surg. 2005;115:1-9. Guyuron B, Reed D, Kriegler JS, Davis J, Pashmini N, Amini S. A placebo-controlled surgical trial of the treatment of migraine headaches. Plast Reconstr Surg. 2009;124:461-8. Guyuron B, Kriegler JS, Davis J, Amini SB. Five-year outcome of surgical treatment of migraine headaches. Plast Reconstr Surg. 2011;127:603-8. American Headache Society urges caution in using any surgical intervention in migraine treatment. Position statement of the American Headache Society [Internet]. Mount Royal (NJ): American Headache Society; 2012 April 13 [cited 11 January 2013] Available from: www.americanheadachesociety.org/american_headache_society_urges	Expert consensus

			_caution_in_using_any_surgical_intervention_in_migraine_treatment.	
Neurologic	Don't prescribe opioid or butalbital-containing medications as first-line treatment for recurrent headache disorders. *American Headache Society*	These medications impair alertness and may produce dependence or addiction syndromes, an undesirable risk for the young, otherwise healthy people most likely to have recurrent headaches. They increase the risk that episodic headache disorders such as migraine will become chronic, and may produce heightened sensitivity to pain. Use may be appropriate when other treatments fail or are contraindicated. Such patients should be monitored for the development of chronic headache.	Bigal ME, Lipton RB. Excessive opioid use and the development of chronic migraine. Pain. 2009 Apr;142(3):179-82. Bigal ME, Serrano D, Buse D, Scher AI, Stewart WF, Lipton RB. Migraine medications and evolution from episodic to chronic migraine: a longitudinal population-based study. Headache. 2008;48:1157-68. Scher AI, Stewart WF, Ricci JA, Lipton RB. Factors associated with the onset and remission of chronic daily headache in a population-based study. Pain. 2003;106(1-2):81-9. Katsarava Z, Schneeweiss S, Kurth T, Kroener U, Fritsche G, Eikermann A, Diener HC, Limmroth V. Incidence and predictors for chronicity of headache in patients with episodic migraine. Neurology. 2004 Mar;62(5):788-90.	Expert consensus
Neurologic	Don't recommend prolonged or frequent use of OTC pain medications for headache. *American Headache Society*	OTC medications are appropriate treatment for occasional headaches if they work reliably without intolerable side effects. Frequent use (especially of caffeine-containing medications) can lead to an increase in headaches, known as medication overuse headache. To avoid this, OTC medication should be limited to no more than two days per week. In addition to medication overuse headache, prolonged overuse of acetaminophen can cause liver damage, while overuse of nonsteroidal anti-inflammatory drugs can lead to gastrointestinal bleeding.	Bigal ME, Serrano D, Buse D, Scher A, Stewart WF, Lipton RB. Acute migraine medications and evolution from episodic to chronic migraine: a longitudinal population-based study. Headache. 2008 Sep;48(8):1157-68. Bigal ME, Lipton RB. Excessive acute migraine medication use and migraine progression. Neurology. 2008 Nov 25;71(22):1821-8. Zwart JA, Dyb G, Hagen K, Svebak S, Holmen J. Analgesic use: a predictor of chronic pain and medication overuse headache—the Head-HUNT Study. Neurology. 2003;61:160-4. Silberstein SD. Practice parameter: evidence-based guidelines for migraine headache (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology. 2000;55:754-62.	AAN guideline
Neurologic	Don't prescribe opioid analgesics as first-line therapy to treat chronic non-cancer pain. *American Society of Anesthesiologists–Pain Medicine*	Physicians should consider multimodal therapy, including non-drug treatments such as behavioral and physical therapies prior to pharmacological intervention. If drug therapy appears indicated, non-opioid medication (e.g., NSAIDs, anticonvulsants) should be trialed prior to commencing opioids.	Chou R, Fanciullo GJ, Fine PG, Adler JA, Ballantyne JC, Davies P, Donovan MI, Fishbain DA, Foley KM, Fudin J, Gilson AM, Kelter A, Mauskop A, O'Connor PG, Passik SD, Pasternak GW, Portenoy RK, Rich BA, Roberts RG, Todd KH, Miaskowski C. Clinical guidelines for the use of chronic opioid therapy in chronic noncancer pain [Internet]. J Pain. 2009 Feb [cited 2014 Jan 10];10(2):113–30. Available from: http://www.ncbi.nlm.nih.gov/pubmed/19187889 American Society of Anesthesiologists Task Force on Chronic Pain Management, American Society of Regional Anesthesia and Pain Medicine. Practice guidelines for chronic pain management: an updated report by the American Society of Anesthesiologists Task Force on Chronic Pain Management and the American Society of Regional Anesthesia and Pain Medicine. Anesthesiology. 2010	ASA guideline

			Apr;112(4):810–33. Argoff CE, Albrecht P, Irving G, Rice F. Multimodal analgesia for chronic pain: rationale and future directions. Pain Med. 2009;10(S2):S53–66.	
Neurologic	Don't prescribe opioid analgesics as long-term therapy to treat chronic non-cancer pain until the risks are considered and discussed with the patient. *American Society of Anesthesiologists–Pain Medicine*	Patients should be informed of the risks of such treatment, including the potential for addiction. Physicians and patients should review and sign a written agreement that identifies the responsibilities of each party (e.g., urine drug testing) and the consequences of non-compliance with the agreement. Physicians should be cautious in coprescribing opioids and benzodiazepines. Physicians should proactively evaluate and treat, if indicated, the nearly universal side effects of constipation and low testosterone or estrogen.	Manchikanti L, Abdi S, Atluri S, Balog CC, Benyamin RM, Boswell MV, Brown KR, Bruel BM, Bryce DA, Burks PA, Burton AW, Calodney AK, Caraway DL, Cash KA, Christo PJ, Damron KS, Datta S, Deer TR, Diwan S, Eriator I, Falco FJ, Fellows B, Geffert S, Gharibo CG, Glaser SE, Grider JS, Hameed H, Hameed M, Hansen H, Harned ME, Hayek SM, Helm S 2nd, Hirsch JA, Janata JW, Kaye AD, Kaye AM, Kloth DS, Koyyalagunta D, Lee M, Malla Y, Manchikanti KN, McManus CD, Pampati V, Parr AT, Pasupuleti R, Patel VB, Sehgal N, Silverman SM, Singh V, Smith HS, Snook LT, Solanki DR, Tracy DH, Vallejo R, Wargo BW; American Society of Interventional Pain Physicians. American Society of Interventional Pain Physicians (ASIPP) guidelines for responsible opioid prescribing in chronic non-cancer pain: part 2—guidance. Pain Physician. 2012 July;15:S67–116. Atluri S, Akbik H, Sudarshan G. Prevention of opioid abuse in chronic non-cancer pain: an algorithmic, evidence based approach. Pain Physician. 2012 Jul;15:ES177–89. Colameco S, Coren JS, Ciervo CA. Continuous opioid treatment for chronic noncancer pain: a time for moderation in prescribing. Postgrad Med. 2009;121(4):61–6. Kahan M, Srivastava A, Wilson L, Gourlay D, Midmer D. Misuse of and dependence on opioids: study of chronic pain patients. Can Fam Physician. 2006;52(9):1081–7. Warner EA. Opioids for the treatment of chronic noncancer pain. Am J Med. 2012;125(12):1155–61.	Expert consensus
Neurologic	Don't prescribe opioids for treatment of chronic or acute pain for workers who perform safety-sensitive jobs such as operating motor vehicles, forklifts, cranes, or other heavy equipment.	The use of both strong and weak opioids has been consistently associated with increased risk of motor vehicle crashes as opioids produce sedation and hinder or impair higher cognitive function. Evidence suggests higher risk with acute opioid use, but risk remains elevated throughout treatment with any opioid and reverses on cessation. Workers who operate motor vehicles/heavy equipment should be precluded from performing these or other safety-sensitive job functions while under treatment with opioids.	Weiss MS, Bowden K, Branco F, et al. Opioids Guideline [Internet]. In: Hegmann K, ed. ACOEM's Occupational Medicine Practice Guidelines. 3rd ed revised. Westminster, CO: Reed Group Ltd. Forthcoming 2014 March. p. 11.	ACOEM guideline

	American College of Occupational and Environmental Medicine			
Neurologic	Don't routinely screen for brain aneurysms in asymptomatic patients without a family or personal history of brain aneurysms, subarachnoid hemorrhage, or genetic disorders that may predispose to aneurysm formation. *American Association of Neurological Surgeons* and *Congress of Neurological Surgeons*	Family history of aneurysmal subarachnoid hemorrhage increases an individual's risk of harboring an aneurysm. Screening patients without a family history or without a personal history of subarachnoid hemorrhage is not indicated.	Bederson JB, et al. Recommendations for the management of patients with unruptured intracranial aneurysms: a statement for healthcare professionals from the Stroke Council of the American Heart Association. Circulation 2000, 102 (18): 2300–8.	AHA guideline
Neurologic	Don't routinely use seizure prophylaxis in patients following ischemic stroke. *American Association of Neurological Surgeons* and *Congress of Neurological Surgeons*	Seizures may complicate the clinical course of patients who have suffered a stroke. However, there is no evidence that using prophylactic antiepileptic drugs prevents seizure occurrence. For patients who suffer a seizure after a stroke, seizure treatment may be required.	Kwan J, Wood E. Antiepileptic drugs for the primary and secondary prevention of seizures after stroke. Cochrane Database of Systematic Reviews 2010, Issue 1. Art. No.: CD005398. doi: 10.1002/14651858.CD005398.pub2.	Cochrane systematic review
Neurologic **Orthopedic**	Don't order an electromyogram for low back pain unless there is leg pain or sciatica. *American Academy of Physical Medicine and Rehabilitation*	Utilization of electromyogram studies for diagnosis of low back pain without leg pain is not supported. Electromyogram studies have good specificity for the detection of lumbosacral radiculopathy in sciatica patients when appropriate electrodiagnostic criteria are used.	Tong HC. Specificity of needle electromyography for lumbar radiculopathy in 55- to 79-yr-old subjects with low back pain and sciatica without stenosis. Am J Phys Med Rehabil. 2011 Mar;90(3):233–8.	Expert consensus

Neurologic **Psychiatric**	Avoid polysomnography in chronic insomnia patients unless symptoms suggest a comorbid sleep disorder. *American Academy of Sleep Medicine*	Chronic insomnia is diagnosed by a clinical evaluation that includes a thorough sleep history along with a medical, substance, and psychiatric history. Some instruments can be helpful at the clinical encounter; these include self-administered questionnaires, sleep logs completed at home, and symptom checklists. Although polysomnography may confirm self-reported symptoms of chronic insomnia, it does not provide additional information necessary for diagnosis of chronic insomnia. However, polysomnography is indicated in some specific circumstances; for example, when sleep apnea or sleep-related movement disorders are suspected, the initial diagnosis is uncertain, behavioral or pharmacologic treatment fails, or sudden arousals occur with violent or injurious behavior.	Schutte-Rodin S, Broch L, Buysse D, Dorsey C, Sateia M. Clinical guideline for the evaluation and management of chronic insomnia in adults. J Clin Sleep Med. 2008;4(5):487-504. Sateia M, Doghramji K, Hauri P, Morin CM. Evaluation of chronic insomnia. Sleep. 2000;23(2):243-308. Chesson A Jr, Hartse K, Anderson WM, Davila D, Johnson S, Littner M, Wise M, Rafecas J. Practice parameters for the evaluation of chronic insomnia. An American Academy of Sleep Medicine report. Standards of Practice Committee of the American Academy of Sleep Medicine. Sleep. 2000;23(2):237-41. Reite M, Buysse D, Reynolds C, Mendelson W. The use of polysomnography in the evaluation of insomnia. Sleep. 1995;18(1):58-70.	Expert consensus
Neurologic	Don't use polysomnography to diagnose restless legs syndrome, except rarely when the clinical history is ambiguous and documentation of periodic leg movements is necessary. *American Academy of Sleep Medicine*	Restless legs syndrome is a neurologic disorder that can be diagnosed based on a patient's description of symptoms and additional clinical history. Polysomnography generally does not provide additional information necessary to make the diagnosis. If a patient's clinical history for RLS is ambiguous, PSG to assess for periodic leg movements may be useful to help confirm an RLS diagnosis.	Kushida CA, Littner MR, Morgenthaler T, Alessi CA, Bailey D, Coleman J Jr, Friedman L, Hirshkowitz M, Kapen S, Kramer M, Lee-Chiong T, Loube DL, Owens J, Pancer JP, Wise M. Practice parameters for the indications for polysomnography and related procedures: an update for 2005. Sleep. 2005;28(4):499-521. American Academy of Sleep Medicine. International classification of sleep disorders, 3rd ed. Darien, Ill.: American Academy of Sleep Medicine; 2014.	Expert consensus
Neurologic	Don't do nerve conduction studies without also doing a needle EMG for testing for radiculopathy, a pinched nerve in the neck or back.	For diagnosis of a pinched nerve in the neck or back, nerve conduction studies alone cannot make the diagnosis. Needle EMG is necessary to identify and characterize the disease process.	Dillingham TR, Lauder TD, Andary M, Kumar S, Pezzin LE, Stephens RT, Shannon S. Identifying lumbrosacral radiculopathies: an optimal electromyographic screen. Am J Phys Med Rehabil. 2000;79(6):496-503. Dillingham TR, Lauder TD, Andary M, Kumar S, Pezzin LE, Stephens RT, Shannon S. Identification of cervical radiculopathies: optimizing the electromyographic screen. Am J Phys Med Rehabil. 2001;80(2):84-91.	Expert consensus

	American Association of Neuromuscular & Electrodiagnostic Medicine			
Neurologic	Don't do an MRI scan of the spine or brain for patients with only peripheral neuropathy (without signs or symptoms suggesting a brain or spine disorder). *American Association of Neuromuscular and Electrodiagnostic Medicine*	Because the vast majority of people with peripheral neuropathy (also called polyneuropathy) have the longest nerves of the body primarily affected (mostly in the toes and feet, but sometimes also in the hands), there is essentially no justification for MRI of the brain or spine in these cases.	England, JD Gronseth GS, Franklin G, Carter GT, Kinsella LJ, Cohen JA, Asbury AK, Szigeti K, Lupski JR, Latov N, Lewis RA, Low PA, Fisher MA, Herrmann DN, Howard JF Jr, Lauria G, Miller RG, Polydefkis M, Sumner AJ; American Academy of Neurology. Practice Parameter: evaluation of distal symmetric polyneuropathy: role of laboratory and genetic testing (an evidence-based review). Report of the American Academy of Neurology, American Association of Neuromuscular and Electrodiagnostic Medicine, and American Academy of Physical Medicine and Rehabilitation. Neurology. 2009;72(2):185-92.	American Academy of Neurology guidelines
Neurologic **Emergency medicine**	Don't use phenytoin or fosphenytoin to treat seizures caused by drug toxicity or drug withdrawal. *American College of Medical Toxicology and The American Academy of Clinical Toxicology*	With rare exceptions, phenytoin is ineffective for convulsions caused by drug or medication toxicity. Phenytoin has been demonstrated to be ineffective for the treatment of isoniazid-induced seizures and withdrawal seizures and may potentially be harmful when used to treat seizures induced by theophylline or cyclic antidepressants. First-line treatment of toxin-induced seizures and withdrawal seizures is benzodiazepines, followed by additional medications that act through agonism at the γ-aminobutyric acid A receptor, such as barbiturates.	Goldberg MJ, Spector R, Miller G. Phenobarbital improves survival in theophylline-intoxicated rabbits. J Toxicol Clin Toxicol. 1986;24(3):203–11. Blake KV, Massey KL, Hendeles L, Nickerson D, Neims A. Relative efficacy of phenytoin and phenobarbital for the prevention of theophylline-induced seizures in mice. Ann Emerg Med. 1988 Oct;17(10):1024–8. Miller J, Robinson A, Percy AK. Acute isoniazid poisoning in childhood. Am J Dis Child. 1980 Mar;134(3):290–2. Saad SF, el-Masry AM, Scott PM. Influence of certain anticonvulsants on the concentration of gamma-aminobutyric acid in the cerebral hemispheres of mice. Eur J Pharmacol 1972 Mar;17(3):386–92. Okamoto M, Rosenberg HC, Boisse NR. Evaluation of anticonvulsants in barbiturate withdrawal. J Pharmacol Exp Ther. 1977 Aug;202(2):479–89. Chance JF. Emergency department treatment of alcohol withdrawal seizures with phenytoin. Ann Emerg Med. 1991 May;20:520–2. Sharma AN, Hoffman RJ. Toxin-related seizures. Emerg Med Clin North Am. 2011 Feb;29(1):125-39. Hung OL, Shih RD. Antiepileptic drugs: the old and the new. Emerg Med Clin North Am. 2011 Feb;29(1):141-50	Expert consensus

Topic area(s)	Recommendation	Rationale and comments	References	Source
Obstetric	Don't schedule non–medically-indicated (elective) inductions of labor or cesarean deliveries before 39 weeks 0 days gestational age. *American Academy of Family Physicians* *American College of Obstetricians and Gynecologists*	Delivery prior to 39 weeks 0 days has been shown to be associated with an increased risk of learning disabilities and a potential increase in morbidity and mortality. There are clear medical indications for delivery prior to 39 weeks and 0 days based on maternal and/or fetal conditions. A mature fetal lung test, in the absence of appropriate clinical criteria, is not an indication for delivery.	Main E, et al. Elimination of nonmedically indicated (elective) deliveries before 39 weeks gestational age. California Maternal Quality Care Collaborative Toolkit to Transform Maternity Care. Developed under contract #08-85012 with the California Department of Public Health; Maternal, Child and Adolescent Health Division. First edition published by March of Dimes, July 2010.	California Department of Public Health
Obstetric	Avoid elective, non–medically-indicated inductions of labor between 39 weeks 0 days and 41 weeks 0 days unless the cervix is deemed favorable. *American Academy of Family Physicians* *American College of Obstetricians and Gynecologists*	Ideally, labor should start on its own initiative whenever possible. Higher cesarean delivery rates result from inductions of labor when the cervix is unfavorable. Health care clinicians should discuss the risks and benefits with their patients before considering inductions of labor without medical indications.	American Academy of Pediatrics, American College of Obstetricians and Gynecologists. Guidelines for Perinatal Care. 6th ed. Elk Grove Village, Ill.: AAP; Washington, DC: ACOG; 2007. American College of Obstetricians and Gynecologists. Induction of labor. Practice bulletin no. 107. Obstet Gynecol. 2009;114:386-97. Gulmezoglu AM, et al. Induction of labour for improving birth outcomes for women at or beyond term. Cochrane Database Syst Rev. 2012;(6):CD004945.	AAP/ACOG guidelines, Cochrane Database of Systematic reviews
Obstetric	Don't perform routine cervical length screening for preterm birth risk assessment in asymptomatic women before 16 weeks of gestation or beyond 24 weeks of gestation. *Society for Maternal-Fetal Medicine*	The predictive ability of cervical length measurement prior to 16 weeks of gestation for preterm birth risk assessment is limited. It should be performed, when indicated, between 16 and 24 weeks of gestation. Routine cervical length screening for preterm birth risk assessment in asymptomatic women beyond 24 weeks of gestation has not been proven to be effective.	Iams JD, Goldenberg RL, Meis PJ, Mercer BM, Moawad A, Das A, Thom E, McNellis D, Copper RL, Johnson F, Roberts JM. The length of the cervix and the risk of spontaneous premature delivery. National Institute of Child Health and Human Development Maternal Fetal Medicine Unit Network. N Engl J Med. 1996 Feb 29;334(9):567-72. Conoscenti G, Meir YJ, D'Ottavio G, Rustico MA, Pinzano R, Fischer-Tamaro L, Stampalija T, Natale R, Maso G, Mandruzzato G. Does cervical length at 13–15 weeks' gestation predict preterm delivery in an unselected population? Ultrasound Obstet Gynecol. 2003 Feb;21(2):128-34. Ozdemir I, Demirci F, Yucel O, Erkorkmaz U. Ultrasonographic	Prospective cohort studies

			cervical length measurement at 10-14 and 20-24 weeks gestation and the risk of preterm delivery. Eur J Obstet Gynecol Reprod Biol. 2007 Feb;130(2):176-9. Berghella V, Talucci M, Desai A. Does transvaginal sonographic measurement of cervical length before 14 weeks predict preterm delivery in high-risk pregnancies? Ultrasound Obstet Gynecol. 2003 Feb;21(2):140-4.	
Obstetric	Don't perform antenatal testing on women with the diagnosis of gestational diabetes who are well controlled by diet alone and without other indications for testing. *Society for Maternal-Fetal Medicine*	Monitoring of glucose levels and maintaining adequate glycemic control for gestational diabetes are paramount to decreasing adverse outcomes, including stillbirth. If nutritional modification and glucose monitoring alone control maternal glycemic status such that pharmacological therapy is not required, the risk of stillbirth due to uteroplacental insufficiency is not increased. Thus, the use of routine antepartum testing (e.g., biophysical profile or nonstress test) in the absence of other comorbidities is not indicated.	Rosenstein MG, Cheng YW, Snowden JM, Nicholson JM, Doss AE, Caughey AB. The risk of stillbirth and infant death stratified by gestational age in women with gestational diabetes. Am J Obstet Gynecol. 2012;206:309.e1-7.	Retrospective cohort study
Obstetric	Don't place women, even those at high-risk, on activity restriction to prevent preterm birth. *Society for Maternal-Fetal Medicine*	There are no studies documenting an improvement in outcomes in women at risk for preterm birth who are placed on activity restriction, including bed rest. There are multiple studies documenting untoward effects of routine activity restriction on the mother and family, including negative psychosocial effects. Therefore, activity restriction should not be routinely prescribed as a treatment to reduce preterm birth.	Society for Maternal-Fetal Medicine (SMFM), Habeber E, Sciscione A. SMFM Consult Activity Restriction in Pregnancy. Contemp Ob Gyn. 2014.	SMFM guideline
Obstetric	Don't promote induction or augmentation of labor and don't induce or augment labor without a medical indication; spontaneous labor is safest for woman and infant, with benefits that improve safety and promote short- and	The rate of induction in the United States (23.4% of all births) has more than doubled since 1990. The increase is not thought to be attributable to a similar rise in medical conditions in pregnancy that warrant induction of labor. Researchers have demonstrated that induction of labor for any reason increases the risk for a number of complications for women and infants. Induced labor results in more	Non-medically indicated induction and augmentation of labor. J Obstet Gynecol Neonatal Nurs. 2014 Sep-Oct;43(5):678-81. Bugg GJ, Siddiqui F, Thornton JG. Oxytocin versus no treatment or delayed treatment for slow progress in the fi stage of spontaneous labour. Cochrane Database Syst Rev. 2013 Jun 23;6:CD007123. Goer H, Roman A, Sakala A. Childbirth Connection. Vaginal or cesarean birth: What is at stake for women and babies? New York (NY): Childbirth Connection; 2012. 52 p. Available from: http://transform.childbirthconnection.org/reports/cesarean/. Institute for Safe Medication Practices. ISMP's list of high-alert	Cochrane Database of Systematic reviews

	long-term maternal and infant health. *American Academy of Nursing*	postpartum hemorrhage than spontaneous labor, which increases the risk for blood transfusion, hysterectomy, placenta implantation abnormalities in future pregnancies, a longer hospital stay, and more hospital readmissions. Induction of labor is also associated with a significantly higher risk of cesarean birth. For infants, a number of negative health effects are associated with induction, including increased fetal stress and respiratory illness. Research on the risk-to-benefit ratio of elective augmentation of labor is limited. However, many of the risks associated with elective induction may extend to augmentation. In a recent systematic review, the authors found that women with slow progress in the first stage of spontaneous labor who underwent augmentation with exogenous oxytocin, compared with women who did not receive oxytocin, had similar rates of cesarean. Such results call into question a primary rationale for labor augmentation, which is the reduction of cesarean surgery. In addition to the serious health problems associated with non–medically indicated induction of labor, hospitals, insurers, providers, and women must consider a number of financial implications associated with the practice. In the United States, the average cost of an uncomplicated cesarean birth is 68% higher than the cost of an uncomplicated vaginal birth. Further, women who deliver vaginally have shorter hospital stays, fewer hospital readmissions, faster recoveries, and fewer infections than those who have cesareans.	medications. ISMP Medication Safety Alert. 2007;5(8)1-4. Available from: http://www.ismp.org/Newsletters/nursing/Issues/NurseAdviseERR200708.pdf. Martin JA, Hamilton BE, Ventura SJ, Osterman MJ, Wilson EC, Mathews TJ. Births: final data for 2010. Natl Vital Stat Rep. 2012 Aug 28;61(1):1-72. Moore J, Low LK. Factors that influence the practice of elective induction of labor: what does the evidence tell us? J Perinat Neonatal Nurs. 2012 Jul-Sep;26(3):242-50. Moore JE, Low LK, Titler MG, Dalton VK, Sampselle CM. Moving toward patient-centered: women's decisions, perceptions, and experiences of the induction of labor process. Birth. 2014 Jun;41(2):138-46. Zhang J, Troendle J, Reddy UM, Laughon SK, Branch DW, Burkman R, Landy HJ, Hibbard JU, Haberman S, Ramirez MM, Bailit JL, Hoff MK, Gregory KD, Gonzalez-Quintero VH, Kominiarek M, Learman LA, Hatjis CG, van Veldhuisen P; Consortium on Safe Labor. Contemporary cesarean delivery practice in the United States. Am J Obstet Gynecol. 2010 Oct; 203(4), 326.e1–326.e10.	
Obstetric	Don't perform prenatal ultrasounds for non-	Prenatal ultrasounds are an integral part of a woman's prenatal care. While obstetric	ACOG Committee Opinion. Number 297, August 2004. Nonmedical use of obstetric ultrasonography. ACOG Committee on Ethics. Obstet	Expert consensus

	medical purposes, for example, solely to create keepsake videos or photographs. *ACOG*	ultrasound has an excellent safety record, the U.S. Food and Drug Administration considers keepsake imaging as an unapproved use of a medical device. The American Institute of Ultrasound in Medicine also discourages the non-medical use of ultrasound for entertainment purposes. Keepsake ultrasounds are not medical tests and should not replace a clinically performed sonogram.	Gynecol. 2004 Aug;104(2):423-4. U.S. Food and Drug Administration. Fetal keepsake videos. Available at: http://www.fda.gov/medicaldevices/Safety/AlertsandNotices/PatientAlerts/ucm064756.htm. Retrieved December 9, 2015. Abramowicz JS, Barnett SB; ISUOG; WFUMB. The safe use of non-medical ultrasound: a summary of the proceedings of the joint safety symposium of ISUOG and WFUMB. Ultrasound Obstet Gynecol. 2009 May;33(5):617-20. American Institute of Ultrasound in Medicine. Prudent use in pregnancy. Laurel (MD): AIUM; 2012. Available at: http://www.aium.org/officialstatements/33. Retrieved December 9, 2015. Chervenak FA, McCullough LB. An ethical critique of boutique fetal imaging: a case for the medicalization of fetal imaging. Am J Obstet Gynecol. 2005;192(1):31–3.	
Obstetric	Don't routinely recommend activity restriction or bed rest during pregnancy for any indication. *ACOG*	Bed rest or activity restriction has been commonly recommended for a variety of conditions in pregnancy including multiple gestation, intrauterine growth restriction, preterm labor, premature rupture of membranes, vaginal bleeding, and hypertensive disorders in pregnancy. However, information to date does not show an improvement in birth outcome with the use of bed rest or activity restriction, but does show an increase in loss of muscle conditioning and thromboembolic disease.	McCall CA, Grimes DA, Lyerly AD. "Therapeutic" bed rest in pregnancy: unethical and unsupported by data. Obstet Gynecol. 2013;121:1305–8. Fox NS, Gelber SE, Kalish RB, Chasen ST. The recommendation for bed rest in the setting of arrested preterm labor and premature rupture of membranes. Am J Obstet Gynecol. 2009;200:165.e1–165.e6. Grobman WA, Gilbert SA, Iams JD, Spong CY, Saade G, Mercer BM, et al. Activity restriction among women with a short cervix. Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network. Obstet Gynecol. 2013;121:1181–6. Maloni JA. Lack of evidence for prescription of antepartum bed rest. Expert Rev Obstet Gynecol. 2011;6:385–93. Brennan MC, Moore LE. Pulmonary embolism and amniotic fluid embolism in pregnancy. Obstet Gynecol Clin North Am. 2013;40:27–35. Promislow JH, Hertz-Picciotto I, Schramm M, Watt-Morse M, Anderson JJ. Bed rest and other determinants of bone loss during pregnancy. Am J Obstet Gynecol. 2004;191:1077–83. Merriam AA, Chichester M, Patel N, Hoffman MK. Bed rest and	Cochrane review

			gestational diabetes: more reasons to get out of bed in the morning [abstract]. Obstet Gynecol. 2014;123(suppl 1):70S. Sosa CG, Althabe F, Belizán JM, Bergel E. Bed rest in singleton pregnancies for preventing preterm birth. Cochrane Database of Systematic Reviews 2015, Issue 3. Art. No.: CD003581. Sciscione AC. Maternal activity restriction and the prevention of preterm birth. Am J Obstet Gynecol. 2010;202:232.e1–e5.	
Obstetric **Genetic**	Don't offer noninvasive prenatal testing to low-risk patients or make irreversible decisions based on the results of this screening test. *Society for Maternal-Fetal Medicine*	NIPT has only been adequately evaluated in singleton pregnancies at high risk for chromosomal abnormalities (maternal age >35, positive screening, sonographic findings suggestive of aneuploidy, translocation carrier at increased risk for trisomy 13, 18, or 21, or prior pregnancy with a trisomy 13, 18, or 21). Its utility in low-risk pregnancies remains unclear. False-positive and false-negative results occur with NIPT, particularly for trisomy 13 and 18. Any positive NIPT result should be confirmed with invasive diagnostic testing prior to a termination of pregnancy. If NIPT is performed, adequate pretest counseling must be provided to explain the benefits and limitations.	American College of Obstetricians and Gynecologists Committee on Genetics. Noninvasive prenatal testing for fetal aneuploidy. Committee Opinion No. 545. Obstet Gynecol. 2012 Dec;120(6):1532–4.	Expert consensus
Obstetric **Infectious disease**	Don't perform maternal serologic studies for cytomegalovirus (CMV) and toxoplasmosis as part of routine prenatal laboratory studies. *Society for Maternal-Fetal Medicine*	Routine serologic screening of pregnant women for CMV and toxoplasmosis is not recommended due to poor predictive value of these tests and potential for harm due to false positive results. Serologic screening during pregnancy for both diseases should be reserved for situations in which there is clinical or ultrasound suspicion of maternal or fetal infection.	Society for Maternal-Fetal Medicine (SMFM), Hughes BL, Gyamfi-Bannerman C. Society for Maternal-Fetal Medicine Consult Series #39: Diagnosis and antenatal management of congenital cytomegalovirus (CMV) infection. Am J Obstet Gynecol. 2016 (in press). American College of Obstetricians and Gynecologists. Practice Bulletin #151: Cytomegalovirus, Parvovirus B19, varicella zoster, and toxoplasmosis in pregnancy. Obstet Gynecol. 2015 Jun;125(6):1510-25.	Expert consensus
Obstetric **Neurologic**	Don't prescribe opioid pain medication in pregnancy without fully weighing the risks to the woman and her fetus, and discussing these risks with the	In utero exposure to opioids can lead to risks for the infant, including neonatal abstinence syndrome and/or developmental deficits affecting behavior and cognition. Pregnant women's use of opioids dramatically increased from 1.19 per 1,000 hospital births in	Opioid abuse, dependence, and addiction in pregnancy. ACOG committee opinion number 524. Washington (DC): American College of Obstetricians and Gynecologists. 2012 May. Available from: http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Health-Care-for-Underserved-Women/Opioid-Abuse-Dependence-and-Addiction-in-Pregnancy.	Expert consensus

	patient. *American Academy of Nursing*	2000 to 5.63 per 1,000 hospital births in 2009. Prescription opioids are among the most effective medications for the treatment of pain. However, regular or long-term use of opioids can create physical dependence and in some cases, addiction. Women who are prescribed, or continue to use, opioids during pregnancy may not understand the risks to themselves or their babies. Pregnant women and their fetuses are an inherently vulnerable population, and opioid dependence increases their vulnerability. Women using opioids during pregnancy were shown to have higher rates of depression, anxiety, and chronic medical conditions, as well as increased risks for preterm labor, poor fetal growth, and stillbirth. Women who used opioids during pregnancy were four times as likely to have a prolonged hospital stay compared to nonusers and incurred significantly more per-hospitalization cost. Neonatal abstinence syndrome occurs in newborns that are exposed to substances, typically opioids, while in their mothers' wombs. In utero exposure to these substances can cause a newborn to experience withdrawal symptoms after birth. Symptoms of neonatal abstinence syndrome vary depending on the type and amount of the substance that the mother used, how the mother and fetus metabolize the drug, and how long the mother used the drug. Symptoms of neonatal abstinence syndrome range from blotchy skin and sneezing, to respiratory complications, low birth weight, prematurity, feeding difficulties, extreme irritability, and seizures.	Criminalization of pregnant women with substance use disorders. J Obstet Gynecol Neonatal Nurs. 2015 Jan-Feb; 44(1), 155–7. Medication use in pregnancy: a public health concern. Atlanta (GA): Centers for Disease Control and Prevention. 2015 Jan 16 [cited 2016 May 15]. Available from: http://www.cdc.gov/pregnancy/meds/treatingfortwo/facts.html. Opioid painkillers widely prescribed among reproductive age women. Atlanta (GA): Centers for Disease Control and Prevention. 2015 Jan 22 [cited 2016 May 22]. Available from: http://www.cdc.gov/media/releases/2015/p0122-pregnancy-opioids.html. Patrick SW, Schumacher RE, Benneyworth BD, Krans EE, McAllister JM, Davis MM. Neonatal abstinence syndrome and associated health care expenditures: United States, 2000-2009. JAMA. 2012 May 9;307(18):1934-40. Addressing prescription drug abuse in the United States: current activities and future opportunities. Washington (DC): Department of Health and Human Services. 2013 Sep. 36 p. Volkow ND. Prescription opioid and heroin use. Bethesda (MD): National Institute on Drug Abuse. 2014 Apr. Whiteman VE, Salemi JL, Mogos MF, Cain MA, Aliyu MH, Salihu HM. Maternal opioid drug use during pregnancy and its impact on perinatal morbidity, mortality, and the costs of medical care in the United States. J Pregnancy. 2014:906723.	

Topic area(s)	Recommendation	Rationale and comments	References	Source
Oncologic **Gastro-enterologic**	Don't obtain routine blood work (e.g., complete blood count, liver function tests) other than a carcinoembryonic antigen level during surveillance for colorectal cancer. *Society of Surgical Oncology*	Due to lack of sensitivity and accuracy in detecting early recurrences, current evidence does not support measurement of complete blood count or liver function tests for surveillance following colorectal cancer treatment. Although evidence is not unequivocal, surveillance regimens that include serial carcinoembryonic antigen testing have been associated with improved survival. Depending on the stage of nonmetastatic disease, accepted components for colorectal cancer surveillance include a combination of history and physical examination; carcinoembryonic antigen; CT of the chest, abdomen, and pelvis; and colonoscopy at variable intervals depending on stage and risk of recurrent disease.	Benson AB 3rd, Bekaii-Saab T, Chan E, Chen YJ, Choti MA, Cooper HS, Engstrom PF, Enzinger PC, Fakih MG, Fenton MJ, Fuchs CS, Grem JL, Hunt S, Kamel A, Leong LA, Lin E, May KS, Mulcahy MF, Murphy K, Rohren E, Ryan DP, Saltz L, Sharma S, Shibata D, Skibber JM, Small W Jr, Sofocleous CT, Venook AP, Willett CG, Gregory KM, Freedman-Cass DA; National Comprehensive Cancer Network. Localized colon cancer, version 3.2013: featured updates to the NCCN Guidelines. J Natl Compr Canc Netw. 2013 May 1;11(5):519-28. El-Shami K, Oeffinger KC, Erb NL, Willis A, Bretsch JK, Pratt-Chapman ML, Cannady RS, Wong SL, Rose J, Barbour AL, Stein KD, Sharpe KB, Brooks DD, Cowens-Alvarado RL. American Cancer Society colorectal cancer survivorship care guidelines. CA Cancer J Clin. 2015;65(6):428-55. Meyerhardt JA, Mangu PB, Flynn PJ, Korde L, Loprinzi CL, Minsky BD, Petrelli NJ, Ryan K, Schrag DH, Wong SL, Benson AB 3rd; American Society of Clinical Oncology. Follow-up care, surveillance protocol, and secondary prevention measures for survivors of colorectal cancer: American Society of Clinical Oncology clinical practice guideline endorsement. J Clin Oncol. 2013 Dec 10;31(35):4465-70.	National Comprehensive Cancer Network, ACS, American Society of Clinical Oncology guidelines
Oncologic **Gynecologic**	Don't perform Pap tests for surveillance of women with a history of endometrial cancer. *Society of Gynecologic Oncology*	Pap testing of the top of the vagina in women treated for endometrial cancer does not improve detection of local recurrence. False-positive Pap smears in this group can lead to unnecessary procedures such as colposcopy and biopsy.	Salani R, Backes FJ, Fung MF, Holschneider CH, Parker LP, Bristow RE, Goff BA. Posttreatment surveillance and diagnosis of recurrence in women with gynecologic malignancies: Society of Gynecologic Oncologists recommendations. Am J Obstet Gynecol. 2011;204:466-78. Salani R, Nagel CI, Drennen E, Bristow RE. Recurrence patterns and surveillance for patients with early stage endometrial cancer. Gynecol Oncol. 2011;123:205-7. Bristow RE, Purinton SC, Santillan A, Diaz-Montes TP, Gardner GJ, Giuntoli RL II. Cost-effectiveness of routine vaginal cytology for endometrial cancer surveillance. Gynecol Oncol. 2006;103:709-13.	Society of Gynecologic Oncology guideline

Oncologic **Gynecologic**	Don't perform colposcopy in patients treated for cervical cancer with Pap tests of low-grade squamous intraepithelial lesion or less. *Society of Gynecologic Oncology*	Colposcopy for low-grade abnormalities in this group does not detect recurrence unless there is a visible lesion and is not cost effective.	Rimel BJ, Ferda A, Erwin J, Dewdney SB, Seamon L, Gao F, DeSimone C, Cotney KK, Huh W, Massad LS. Cervicovaginal cytology in the detection of recurrence after cervical cancer treatment. Obstet Gynecol. 2011;118:548-53. Tergas A HL, Guntupalli SR, Huh WK, Massad LS, Fader AN, Rimel BJ. A cost analysis of colposcopy following abnormal cytology in posttreatment surveillance for cervical cancer. Gynecol Oncol. 2013.	Expert consensus
Oncologic **Women's Health**	Don't routinely recommend follow-up mammograms more often than annually for women who have had radiotherapy following breast conserving surgery. *American Society for Radiation Oncology*	Studies indicate that annual mammograms are the appropriate frequency for surveillance of breast cancer patients who have had breast conserving surgery and radiation therapy with no clear advantage to shorter interval imaging. Patients should wait 6-12 months after the completion of radiation therapy to begin their annual mammogram surveillance. Suspicious findings on physical examination or surveillance imaging might warrant a shorter interval between mammograms.	Khatcheressian JL. Breast cancer follow-up and management after primary treatment: an American Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013 Mar 1;31(7):961–5. Grunfeld E. Cancer practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005 May 10;172(10):1319–20. Gradishar WJ. NCCN Clinical Practice Guidelines in Oncology. Breast Cancer. Version 3.2014. Rojas MP. Follow-up strategies for women treated with early breast cancer. Cochrane Database Syst Rev. 2005;1:CD001768. McNaul D, Darke M, Garg M, Dale P. An evaluation of post-lumpectomy recurrence rates: is follow-up every 6 months for 2 years needed? J Surg Oncol. 2013;107(6):597–601.	Cochrane Database of Systematic Reviews, American Society of Clinical Oncology guideline

Topic area(s)	Recommendation	Rationale and comments	References	Source
Ophthal-mologic **Infectious disease**	Don't order antibiotics for adenoviral conjunctivitis. *American Academy of Ophthalmology*	Adenoviral conjunctivitis and bacterial conjunctivitis are different forms of infection that can be diagnosed by the ophthalmologist by clinical signs and symptoms, and if needed, by cultures. Antibiotics are of use for patients with bacterial conjunctivitis, particularly with moderate to severe bacterial conjunctivitis. However, they are not useful for adenoviral conjunctivitis and the overuse of antibiotics can lead to the emergence of bacteria that don't respond readily to available treatments. In cases of diagnostic uncertainty, patients may be followed closely to see if their condition resolves on its own or if further treatment is required.	American Academy of Ophthalmology. Conjunctivitis preferred practice pattern. 2011. http://www.aao.org/ppp. Sheikh A, et al. Antibiotics versus placebo for acute bacterial conjunctivitis. Cochrane Database Syst Rev. 2006;(2):CD001211.	Cochrane Database of Systematic Reviews

Ophthal-mologic **Surgical**	Don't perform preoperative medical tests for eye surgery unless there are specific medical indications. *American Academy of Ophthalmology*	For many, preoperative tests are not necessary and add costs because eye surgeries are not lengthy and don't pose serious risks. An electrocardiogram should be ordered if patients have heart disease. A blood glucose test should be ordered if patients have diabetes. A potassium test should be ordered if patients are on diuretics. In general, patients scheduled for surgery do not need medical tests unless the history or physical examination indicates the need for a test (e.g., like the existence of conditions noted above, heart disease, diabetes, use of diuretics, etc.). Institutional policies should consider these issues.	Schein OD, et al. The value of routine preoperative medical testing before cataract surgery. N Engl J Med. 2000;342:168-75. Keay L, et al. Routine preoperative medical testing for cataract surgery. Cochrane Database Syst Rev. 2009;(2):CD007293. Bartley GB, et al. Preoperative medical examinations for patients undergoing ophthalmic surgery. Am J Ophthalmol. 1991;112:725-7. Imasogie N, et al. Elimination of routine testing in patients undergoing cataract surgery allows substantial savings in laboratory costs. A brief report. Can J Anesth. 2003;50:246-8. Bass EB, et al. Do ophthalmologists, anesthesiologists and internists agree about preoperative testing in health patients undergoing cataract surgery? Arch Ophthalmol. 1995;113:1248-56.	Cochrane Database of Systematic Reviews
Ophthal-mologic **Pediatric**	Don't put asymptomatic children in weak reading glasses. *American Association for Pediatric Ophthalmology and Strabismus*	Low "farsightedness" is a normal finding in children. Children can easily focus to see at near, with their large accommodative reserve. If the reading glasses prescription is low (less than +2.00 diopters), their innate ability to focus can be used to see clearly at both distance and near. If the eyes are not crossed, prescription of weak glasses is generally not necessary.	Donahue SP. How often are spectacles prescribed to "normal" preschool children? J AAPOS. 2004;8:224-9.	Expert consensus
Ophthal-mologic Pediatric **Preventive medicine**	Annual comprehensive eye exams are unnecessary for children who pass routine vision screening assessments. *American Association for Pediatric Ophthalmology and Strabismus*	Early childhood vision screening done as part of routine well-child care accurately identifies most children with significant eye problems that are otherwise asymptomatic. Annual comprehensive eye examinations increase financial costs, a child's absence from school and parental time away from work, with no evidence that the comprehensive exam detects asymptomatic vision problems better than timely, methodical and recurrent screening efforts. Comprehensive eye exams are appropriate for children who do not pass a vision screening.	AAO/AAP/AAPOS/AACO. Eye examination in infants, children, and young adults by pediatricians. May 2007. Pediatrics. 2007;120:683-4. AAO/AAP/AAPOS. Vision screening for infants and children: a joint statement of the American Association for Pediatric Ophthalmology and Strabismus and the American Academy of Ophthalmology. 2007. Available from: http://www.aapos.org//client_data/files/2011/337_visionscreeningforinfantsandchildren2011.pdf. AAPOS vision screening recommendations. Available from: http://www.aapos.org//client_data/files/2013/595_aapos_visscreen.pdf.	American Academy of Ophthal-mology/AAP/ American Association for Pediatric Ophthalmolog y and Strabismus guideline
Ophthal-mologic	Don't routinely order imaging for all patients with double vision. *American Association*	Many people with double vision, or diplopia, want a CT scan or MRI to see if it is caused by a brain tumor or other serious problem. Much of the time, following a comprehensive eye evaluation, neither test is necessary. The most	Lee MS. Diplopia: diagnosis and management. American Academy of Ophthalmology Focal points module. 2007:12.	Expert consensus

	for Pediatric Ophthalmology and Strabismus	common causes of double vision are refractive error, dry eyes, cataract and non-neurologic eye misalignment; all readily diagnosed by a complete exam. Only a minority of cases of diplopia result from problems within the brain.		

Topic area(s)	Recommendation	Rationale and comments	References	Source
Orthopedic	Don't perform imaging for low back pain within the first six weeks unless red flags are present. NOTE: *Red flags include, but are not limited to, severe or progressive neurologic deficits or when serious underlying conditions such as osteomyelitis are suspected.* *American Academy of Family Physicians* *American College of Physicians*	Imaging of the lumbar spine before six weeks does not improve outcomes, but does increase costs. Low back pain is the fifth most common reason for all physician visits.	Agency for Health Care Policy and Research Cochrane Database of Systematic Reviews	Agency for Health Care Policy and Research, Cochrane Database of Systematic Reviews
Orthopedic	Don't use glucosamine and chondroitin to treat patients with symptomatic osteoarthritis of the knee. *American Academy of Orthopaedic Surgeons*	Both glucosamine and chondroitin sulfate do not provide relief for patients with symptomatic osteoarthritis of the knee.	American Academy of Orthopaedic Surgeons. Clinical Practice Guideline on the Treatment of Osteoarthritis of the Knee (Non-Arthroplasty). Rosemont (IL): American Academy of Orthopaedic Surgeons, 2008 Dec. Available from: http://www.aaos.org/research/guidelines/OAKguideline.pdf. Altman RD, Marcussen KC. Effects of a ginger extract on knee pain in patients with osteoarthritis. Arthritis Rheum. 2001;44(11):2531-8. Bourgeois P, Chales G, Dehais J, Delcambre B, Kuntz JL, Rozenberg S. Efficacy and tolerability of chondroitin sulfate 1200 mg/day versus chondroitin sulfate 3 x 400 mg/day versus placebo. Osteoarthritis Cartilage. 1998;6 Suppl A:25-30. Bucsi L, Poor G. Efficacy and tolerability of oral chondroitin sulfate as	RCTs

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Cibere J, Kopec JA, Thorne A, Singer J, Canvin J, Robinson DB, Pope J, Hong P, Grant E, Esdaile JM. Randomized, double-blind, placebo-controlled glucosamine discontinuation trial in knee osteoarthritis. Arthritis Rheum. 2004;51(5):738-45.

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Kahan A, Uebelhart D, De Vathaire F, Delmas PD, Reginster JY. Long-term effects of chondroitins 4 and 6 sulfate on knee osteoarthritis: the study on osteoarthritis progression prevention, a two-year, randomized, double-blind, placebo-controlled trial. Arthritis Rheum. 2009;60(2):524-33.

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Orthopedic	Don't use lateral wedge insoles to treat patients with symptomatic medial compartment osteoarthritis of the knee. *American Academy of Orthopaedic Surgeons*	In patients with symptomatic osteoarthritis of the knee, the use of lateral wedge or neutral insoles does not improve pain or functional outcomes. Comparisons between lateral and neutral heel wedges were investigated, as were comparisons between lateral wedged insoles and lateral wedged insoles with subtalar strapping. The systematic review concludes that there is only limited evidence for the effectiveness of lateral heel wedges and related orthoses. In addition, the possibility exists that those who do not use them may experience fewer symptoms from osteoarthritis of the knee.	American Academy of Orthopaedic Surgeons. Clinical practice guideline on the treatment of osteoarthritis of the knee (non-arthroplasty). Rosemont (IL): American Academy of Orthopaedic Surgeons, 2008 Dec. Available from: http://www.aaos.org/research/guidelines/OAKguideline.pdf. Baker K, Goggins J, Xie H, Szumowski K, Lavalley M, Hunter DJ, Felson DT. A randomized crossover trial of a wedged insole for treatment of knee osteoarthritis. Arthritis Rheum. 2007;56(4):1198-203. Bennell KL, Bowles KA, Payne C, Cicuttini F, Williamson E, Forbes A, Hanna F, Davies-Tuck M, Harris A, Hinman RS. Lateral wedge insoles for medial knee osteoarthritis: 12 month randomized controlled trial. BMJ. 2011;342:d2912. Brouwer RW, Jakma TS, Verhagen AP, Verhaar JA, Bierma-Zeinstra SM. Braces and orthoses for treating osteoarthritis of the knee. Cochrane Database Syst Rev. 2005;1:CD004020. Maillefert JF, Hudry C, Baron G, Kieffert P, Bourgeois P, Lechevalier D, Coutaux A, Dougados M. Laterally elevated wedged insoles in the treatment of medial knee osteoarthritis: a prospective randomized controlled study. Osteoarthritis Cartilage. 2001;9(8):738-45. Nigg BM, Emery C, Hiemstra LA. Unstable shoe construction and reduction of pain in osteoarthritis patients. Med Sci Sports Exerc. 2006;38(10):1701-8. Pham T, Maillefert JF, Hudry C, Kieffert P, Bourgeois P, Lechevalier D, Dougados M. Laterally elevated wedged insoles in the treatment of medial knee osteoarthritis. A two-year prospective randomized	Cochrane Database of Systematic Reviews

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Orthopedic	Don't recommend advanced imaging (e.g., MRI) of the spine within the first six weeks in patients with nonspecific acute low back pain in the absence of red flags. *North American Spine Society*	In the absence of red flags, advanced imaging within the first six weeks has not been found to improve outcomes, but does increase costs. Red flags include, but are not limited to: trauma history, unintentional weight loss, immunosuppression, history of cancer, intravenous drug use, steroid use, osteoporosis, age > 50, focal neurologic deficit, and progression of symptoms.	Chou R, Qaseem A, Snow V, Casey D, Cross JT Jr, Shekelle P, Owens DK; Clinical Efficacy Assessment Subcommittee of the American College of Physicians; American College of Physicians; American Pain Society Low Back Pain Guidelines Panel. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007 Oct 2;147(7):478-91. Forseen S, Corey A. Clinical decision support and acute low back pain: evidence-based order sets. J Am Coll Radiol. 2012 Oct;9(10):704-12.	ACP/American Pain Society guideline
Orthopedic	Don't recommend bed rest for more than 48 hours when treating low back pain.	In patients with low back pain, bed rest exceeding 48 hours in duration has not been shown to be of benefit.	Dahm KT, Brurberg KG, Jamtvedt G, Hagen KB. Advice to rest in bed versus advice to stay active for acute low-back pain and sciatica. Cochrane Database Syst Rev. 2010 Jun 16;(6):CD007612. North American Spine Society. Acute low back pain [Internet]. Blue	Cochrane Database of Systematic Reviews

	North American Spine Society		Ridge (IL): North American Spine Society; 2009. [cited 2012 November 7]. Available from: http://www.knowyourback.org/Pages/SpinalConditions/LowBackPain/Acute.aspx.	
Orthopedic	Avoid imaging studies (MRI, CT or x-rays) for acute low back pain without specific indications. *American Society of Anesthesiologists–Pain Medicine*	Imaging for low back pain in the first six weeks after pain begins should be avoided in the absence of specific clinical indications (e.g., history of cancer with potential metastases, known aortic aneurysm, progressive neurologic deficit). Most low back pain does not need imaging and doing so may reveal incidental findings that divert attention and increase the risk of having unhelpful surgery.	Chou R, Fu R, Carrino JA, Deyo RA. Imaging strategies for low-back pain: systematic review and meta-analysis. Lancet. 2009;373(9662):463–72. Chou R, Qaseem A, Snow V, Casey D, Cross JT, Shekelle P, Owens DK; Clinical Efficacy Assessment Subcommittee of the American College of Physicians; American College of Physicians; American Pain Society Low Back Pain Guidelines Panel. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147(7):478–91. Davis PC, Wippold FJ, Brunberg JA, Cornelius RS, De La Paz RL, Dormont PD, Gray L, Jordan JE, Mukherji SK, Seidenwurm DJ, Turski PA, Zimmerman RD, Sloan MA. ACR appropriateness criteria on low back pain. J Am Coll Radiol. 2009;6(6):401–7. Kendrick D, Fielding K, Bentley E, Miller P, Kerslake R, Pringle M. The role of radiography in primary care patients with low back pain of at least 6 weeks duration: a randomized (unblended) controlled trial. Health Technol Assess. 2001;5(30):1–69. Miller P, Kendrick D, Bentley E, Fielding K. Cost-effectiveness of lumbar spine radiography in primary care patients with low back pain. Spine. 2002;27(20):2291–7.	ACP and American Pain Society guideline
Orthopedic	Don't initially obtain x-rays for injured workers with acute non-specific low back pain. *American College of Occupational and Environmental Medicine*	X-ray is unnecessary for the initial routine management of low back pain unless red flags are present. Even when red flags are suspected, it should not be mandatory to order an x-ray in all cases. There is also no reason, either medically or legally, to obtain low back x-rays as a "baseline" for work-related injuries.	Talmage J, Belcourt R, Galper J, et al. Low back disorders. In: Hegmann K, ed. Occupational Medicine Practice Guidelines. 3rd ed. Elk Grove Village, Ill: American College of Occupational and Environmental Medicine; 2011. p. 336, 373, 376–7.	ACOEM guideline
Orthopedic	Don't routinely order x-ray for diagnosis of plantar fasciitis/heel pain in employees who stand or walk at work.	As the diagnosis of plantar fasciitis is in most cases evident from the worker's history and physical examination, x-ray is not recommended for routine evaluations for plantar fasciitis except in cases where a serious underlying medical condition is suspected (e.g.,	Haas N, Beecher P, Easly M, et al. Ankle and foot disorders. In: Hegmann K, ed. Occupational Medicine Practice Guidelines. 3rd ed. Elk Grove Village, Ill: American College of Occupational and Environmental Medicine; 2011. p. 1182.	ACOEM guideline

	American College of Occupational and Environmental Medicine (ACOEM)	fracture, infection)		
Orthopedic **Sports Medicine**	Avoid ordering a knee MRI for a patient with anterior knee pain without mechanical symptoms or effusion unless the patient has not improved following completion of an appropriate functional rehabilitation program. *American Medical Society for Sports Medicine*	The most common cause of anterior knee pain is patellofemoral pain syndrome. MRI is rarely helpful in managing this syndrome. Treatment should focus on a guided exercise program to correct lumbopelvic and lower limb strength and flexibility imbalances. If pain persists, if there is recurrent swelling or if mechanical symptoms such as locking and painful clicking are present, and radiographs are nondiagnostic, an MRI may be useful.	Dixit S, DiFiori JP, Burton M, Mines B. Management of patellofemoral pain syndrome. Am Fam Physician. 2007 Jan 15;75(2):194–202. Atanda A Jr, Ruiz D, Dodson CC, Frederick RW. Approach to the active patient with chronic anterior knee pain. Phys Sportsmed. 2012 Feb;40(1):41–50. Pappas E, Wong-Tom WM. Prospective predictors of patellofemoral pain syndrome: a systematic review with meta-analysis. Sports Health. 2012 Mar;4(2):115–20. Rixe JA, Glick JE, Brady J, Olympia RP. A review of the management of patellofemoral pain syndrome. Phys Sportsmed. 2013 Sep;41(3):19–28. Roush MB, Sevier TL, Wilson JK, Jenkinson DM, Helfst RH, Gehlsen GM, Basey AL. Anterior knee pain: a clinical comparison of rehabilitation methods. Clin J Sport Med. 2000 Jan;10(1): 22–8.	Expert consensus
Orthopedic **Sports Medicine**	Avoid recommending knee arthroscopy as initial management for patients with degenerative meniscal tears and no mechanical symptoms. *American Medical Society for Sports Medicine*	Degenerative meniscal tears may respond to nonoperative treatments such as exercise to improve muscle strength, endurance, and flexibility. Other treatment options include mild analgesics, anti-inflammatory medication, activity modification, or corticosteroid injection. If mechanical symptoms such as locking, painful clicking, or recurrent swelling are present, or if pain relief is not obtained after a trial of nonoperative treatment, arthroscopy may be warranted. If significant osteoarthritis is also present, other surgical options should be considered.	Yim JH, Seon JK, Song EK, Choi JI, Kim MC, Lee KB, Seo HY. A comparative study of meniscectomy and nonoperative treatment for degenerative horizontal tears of the medial meniscus. Am J Sports Med. 2013 Jul;41(7):1565–70. Herrlin S, Hållander M, Wange P, Weidenhielm L, Werner S. Arthroscopic or conservative treatment of degenerative medial meniscal tears: a prospective randomized trial. Knee Surg Sports Traumatol Arthrosc. 2007 Apr;15(4):393–401. Herrlin S, Wange PO, Lapidus G, Hållander M, Werner S, Weidenhielm L. Is arthroscopic surgery beneficial in treating non-traumatic, degenerative medial meniscal tears? A five year follow-up. Knee Surg Sports Traumatol Arthrosc. 2013 Feb;21(2):358–64.	RCTs
Orthopedic	Don’t obtain imaging (plain radiographs,	Imaging of the spine in patients with acute low back pain during the early phase of symptom	Chou R, et al. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians	Systematic review

	MRI, CT, or other advanced imaging) of the spine in patients with non-specific acute low back pain and without red flags. *American Association of Neurological Surgeons* and *Congress of Neurological Surgeons*	onset is unnecessary. Red flags that may indicate that early imaging of the spine is required can include neurological deficit such as weakness or numbness, any bowel or bladder dysfunction, fever, history of cancer, history of intravenous drug use, immunosuppression, steroid use, history of osteoporosis, or worsening symptoms.	and the American Pain Society. Ann Intern Med. 2007 Oct 2;147(7):478–91.	
Orthopedic	Don't prescribe bed rest for acute localized back pain without completing an evaluation. *American Academy of Physical Medicine and Rehabilitation*	Prolonged bed rest (more than 2 days) in acute localized low back pain has not been shown to improve long term function or pain. Bed rest prescriptions should be limited to less than 48 hours in patients with non-traumatic acute localized low back pain in the absence of traditional red flag signs, including, but not limited to, tumors, neurological issues, and weakness.	Dahm KT, Brurberg KG, Jamtvedt G, Hagen KB. Advice to rest in bed versus advice to stay active for acute low-back pain and sciatica. Cochrane Database Syst Rev. 2010 Jun 16;(6):CD007612.	Cochrane Database of Systematic Reviews
Orthopedic	Don't order an imaging study for back pain without performing a thorough physical examination. *American Academy of Physical Medicine and Rehabilitation*	A thorough history and physical examination are necessary to guide imaging decisions. Ordering spine imaging without obtaining a history and physical examination has not been shown to improve patient outcomes and increases costs.	Chou R, Qaseem A, Owens DK, Shekelle P; Clinical Guidelines Committee of the American College of Physicians. Diagnostic imaging for low back pain: advice for high-value health care from the American College of Physicians. Ann Intern Med. 2011 Feb 1;154(3):181–9.	ACP guideline
Orthopedic	Don't prescribe opiates in acute disabling low back pain before evaluation and a trial of other alternatives is considered. *American Academy of Physical Medicine and Rehabilitation*	Early opiate prescriptions in acute disabling low back pain are associated with longer disability, increased surgical rates, and a greater risk of later opioid use. Opiates should be prescribed only after a physician evaluation by a licensed health care provider and after other alternatives are trialed.	Webster BS. Verma SK. Gatchel RJ. Relationship between early opioid prescribing for acute occupational low back pain and disability duration, medical costs, subsequent surgery and late opioid use. Spine. 2007 Sep 1;32(19):2127–32.	Retrospective cohort study

Orthopedic **Neurologic**	Avoid routinely using irreversible surgical procedures such as braces, occlusal equilibration, and restorations as the first treatment of choice in the management of temporomandibular joint disorders. *American Dental Association*	There is a lack of evidence that temporomandibular joint disorders (defined as musculoskeletal disorders, not the lesion of traumatic occlusion) are always progressive, and evidence exists that in many instances, patients with temporomandibular joint disorder have spontaneous remissions without treatment. Therefore, management is generally conservative and includes reversible strategies such as patient education, medications, physical therapy, and/or the use of occlusal appliances that do not alter the shape or position of the teeth or the alignment of the jaws.	Aggarwal VR, Lovell K, Peters S, Javidi H, Joughin A, Goldthorpe J. Psychosocial interventions for the management of chronic orofacial pain. Cochrane Database Syst Rev. 2011 Nov 9;(11):CD008456. Al-Ani MZ, Davies SJ, Gray RJM, Sloan P, Glenny A-M. Stabilisation splint therapy for temporomandibular pain dysfunction syndrome. Cochrane Database Syst Rev. 2004;(1):CD002778. Treatment for Temporomandibular Joint Dysfunction: guidelines. Ottowa (ON): Canadian Agency for Drugs and Technologies in Health (CA); 2010 May 17. 6 p. De Boever JA, Nilner M, Orthlieb JD, Steenks MH; Educational Committee of the European Academy of Craniomandibular Disorders. Recommendations by the EACD for examination, diagnosis, and management of patients with temporomandibular disorders and orofacial pain by the general dental practitioner. J Orofac Pain. 2008 Summer;22(3):268-78. de Souza RF, Lovato da Silva CH, Nasser M, Fedorowicz Z, Al-Muharraqi MA. Interventions for the management of temporomandibular joint osteoarthritis. Cochrane Database Syst Rev. 2012 Apr 18;4:CD007261. Guidelines: diagnosis & management of temporomandibular disorders & related musculoskeletal disorders. Toronto (ON): Royal College of Dental Surgeons of Ontario (CA); 11 p. Ernst E, White AR. Acupuncture as a treatment for temporomandibular joint dysfunction: a systematic review of randomized trials. Arch Otolaryngol Head Neck Surg. 1999 Mar;125(3):269-72. Forssell H, Kalso EJ. Application of principles of evidence-based medicine to occlusal treatment for temporomandibular disorders: are there lessons to be learned? J Orofac Pain. 2004 Winter;18(1):9-22; discussion 23-32. de Souza RF, Lovato da Silva CH, Nasser M, Fedorowicz Z, Al-Muharraqi MA. Interventions for the management of temporomandibular joint osteoarthritis. Cochrane Database Syst Rev. 2012 Apr 18;4:CD007261. Koh H, Robinson PG. Occlusal adjustment for treating and preventing temporomandibular joint disorders. Cochrane Database Syst Rev. 2003;(1):CD003812.	Cochrane Database of Systematic reviews

			Luther F, Layton S, McDonald F. Orthodontics for treating temporomandibular joint (TMJ) disorders. Cochrane Database Syst Rev. 2010 Jul 7;(7):CD006541. de Leeuw R, Klasser GD. Orofacial pain: guidelines for assessment, diagnosis, and management. 5th Ed. Hanover Park: Quintessence Books; 2013. 312 p.	

Topic area(s)	Recommendation	Rationale and comments	References	Source
Otolaryn-gologic **Infectious disease**	Don't routinely prescribe antibiotics for acute, mild to moderate sinusitis unless symptoms (which must include purulent nasal secretions *and* maxillary pain or facial or dental tenderness to percussion) last at least seven days *or* symptoms worsen after initial clinical improvement. *American Academy of Allergy, Asthma and Immunology* *American Academy of Family Physicans* *American Academy of Otolaryngology – Head and Neck Surgery Foundation*	Most cases of maxillary sinusitis in the ambulatory setting are caused by a viral infection that will resolve on its own. Despite consistent recommendations to the contrary, antibiotics are prescribed in more than 80% of outpatient visits for acute sinusitis. Sinusitis accounts for 16 million office visits and $5.8 billion in annual health care costs.	Centers for Disease Control and Prevention *Annals of Internal Medicine* Ahovuo-Saloranta A, et al. Antibiotics for acute maxillary sinusitis. Cochrane Database Syst Rev. 2008;(2):CD000243.	*Annals of Internal Medicine*, Cochrane Database of Systematic Reviews
Otolaryn-gologic **Infectious disease**	Don't routinely obtain radiographic imaging for patients who meet diagnostic criteria for uncomplicated acute rhinosinusitis.	Imaging of the paranasal sinuses, including plain film radiography, CT, and MRI, is unnecessary in patients who meet the clinical diagnostic criteria for uncomplicated acute rhinosinusitis. Acute rhino-sinusitis is defined as up to four weeks of purulent nasal drainage	Rosenfeld RM, et al. Clinical practice guideline: adult sinusitis. Otolaryngol Head Neck Surg. 2007;137(3 suppl):S1-31.	AAO-HNSF practice guideline

	American Academy of Otolaryngology – Head and Neck Surgery Foundation	(anterior, posterior, or both) accompanied by nasal obstruction, facial pain-pressure-fullness, or both. Imaging is costly and may expose patients to radiation. Imaging may be appropriate in patients with a complication of acute rhinosinusitis, patients with comorbidities that predispose them to complications, and patients in whom an alternative diagnosis is suspected.		
Otolaryn-gologic **Infectious disease**	Don't prescribe oral antibiotics for uncomplicated external otitis. *American Academy of Otolaryngology – Head and Neck Surgery Foundation*	Oral antibiotics have significant adverse effects and have been shown to be no more effective than topical antibiotics. Avoidance of oral antibiotics can reduce the spread of antibiotic resistance and the risk of opportunistic infections.	Rosenfeld RM, et al. Clinical practice guideline: acute otitis externa. Otolaryngol Head Neck Surg. 2006;134(4 suppl):S4-23.	AAO-HNSF practice guideline
Otolaryn-gologic **Infectious disease** **Pediatric**	Don't prescribe oral antibiotics for uncomplicated tympanostomy tube otorrhea.[21] *American Academy of Otolaryngology – Head and Neck Surgery Foundation*	Oral antibiotics have significant adverse effects and have been shown to be no more effective than topical antibiotics. Avoidance of oral antibiotics can reduce the spread of antibiotic resistance and the risk of opportunistic infections.	Goldblatt EL, et al. Topical ofloxacin versus systemic amoxicillin/clavulanate in purulent otorrhea in children with tympanostomy tubes. Int J Pediatr Otorhinolaryngol. 1998;46(1-2):91-101.	RCT
Otolaryn-gologic	Don't order CT scan of the head/brain for sudden hearing loss. *American Academy of Otolaryngology – Head and Neck Surgery Foundation*	CT scanning is expensive, exposes the patient to radiation, and offers no useful information that would improve initial management. CT scanning may be appropriate in patients with focal neurologic findings, a history of trauma, or chronic ear disease.	Stachler RJ, et al. Clinical practice guideline: sudden hearing loss. Otolaryngol Head Neck Surg. 2012;146(3 suppl):S1-35.	AAO-HNSF practice guideline
Otolaryn-gologic	Don't obtain CT or MRI in patients with a primary complaint of hoarseness prior to examining the larynx.	Examination of the larynx with mirror or fiberoptic scope is the primary method for evaluating patients with hoarseness. Imaging is unnecessary in most patients and is both costly and has potential for radiation exposure. After	Schwartz SR, et al. Clinical practice guideline: hoarseness (dysphonia). Otolaryngol Head Neck Surg. 2009;141(3 suppl 2):S1-31.	AAO-HNSF practice guideline

	American Academy of Otolaryngology – Head and Neck Surgery Foundation	laryngoscopy, evidence supports the use of imaging to further evaluate 1) vocal fold paralysis or 2) a mass or lesion of the larynx.		
Otolaryn-gologic	Don't order imaging studies in patients with non-pulsatile bilateral tinnitus, symmetric hearing loss, and an otherwise normal history and physical examination. *American Academy of Otolaryngology — Head and Neck Surgery Foundation*	The utility of imaging procedures in primary tinnitus is undocumented; imaging is costly, has potential for radiation exposure, and does not change management.	Tunkel DE, Bauer CA, Sun GH, Rosenfeld RM, Chandrasekhar SS, Cunningham ER Jr, Archer SM, Blakley BW, Carter JM, Granieri EC, Henry JA, Hollingsworth D, Khan FA, Mitchell S, Monfared A, Newman CW, Omole FS, Phillips CD, Robinson SK, Taw MB, Tyler RS, Waguespack R, Whamond EJ. Clinical practice guideline: tinnitus. Otolaryngol Head Neck Surg. 2014;151(S2):S1-40.	Practice guideline
Otolaryn-gologic **Infectious disease**	Don't order more than one CT scan of the paranasal sinuses within 90 days to evaluate uncomplicated chronic rhinosinusitis patients when the paranasal sinus CT obtained is of adequate quality and resolution to be interpreted by the clinician and used for clinical decision-making and/or surgical planning. *American Academy of Otolaryngology — Head and Neck Surgery Foundation*	CT scanning is expensive, exposes the patient to ionizing radiation, and offers no additional information that would improve initial management. Multiple CT scans within 90 days may be appropriate in patients with complicated sinusitis or when an alternative diagnosis is suspected.	Rosenfeld RM, Piccirillo JF, Chandrasekhar SS, Brook I, Kumar KA, Kramper M, Orlandi RR, Palmer JN, Patel, ZM, Peters A, Walsh S, Corrigan MD. Clinical practice guideline: adult sinusitis. Otolaryngol Head Neck Surg. Expected April 2015.	Practice guideline

Topic area(s)	Recommendation	Rationale and comments	References	Source
Pediatric	Cough and cold medicines should not be prescribed or recommended for respiratory illnesses in children younger than four years. *American Academy of Pediatrics*	Research has shown these products offer little benefit to young children, and can have potentially serious side effects. Many cough and cold products for children have more than one ingredient, increasing the chance of accidental overdose if combined with another product.	Carr BC. Efficacy, abuse, and toxicity of over-the-counter cough and cold medications in the pediatric population. Curr Opin Pediatr. 2006;18(2):184-8. Irwin RS, et al. Diagnosis and management of cough executive summary: ACCP evidence-based clinical practice guidelines. Chest. 2006;129(1 suppl):1S-23S. Isbister GK, et al. Restricting cough and cold medications in children. J Paediatr Child Health. 2012;48(2):91-8. Schaeffer MK, et al. Adverse events from cough and cold medication in children. Pediatrics. 2008;121(4):783-82. Sharfstein JM, et al. Over the counter but no longer under the radar–pediatric cough and cold medications. N Engl J Med. 2007;357(23):2321-4.	ACCP guideline
Pediatric **Infectious disease** **Otolaryn-gologic**	Don't prescribe antibiotics for otitis media in children aged two to 12 years with nonsevere symptoms where the observation option is reasonable. *American Academy of Family Physicians*	The "observation option" refers to deferring antibacterial treatment of selected children for 48 to 72 hours and limiting management to symptomatic relief. The decision to observe or treat is based on the child's age, diagnostic certainty and illness severity. To observe a child without initial antibacterial therapy, it is important that the parent or caregiver has a ready means of communicating with the clinician. There also must be a system in place that permits reevaluation of the child.	Lieberthal AS, Carroll AE, Chonmaitree T, Ganiats TG, Hoberman A, Jackson MA, Joffe MD, Miller DT, Rosenfeld RM, Sevilla XD, Schwartz RH, Thomas PA, Tunkel DE, American Academy of Pediatrics. The diagnosis and management of acute otitis media. Pediatrics. 2013 Mar;131(3):e964-99. Venekamp RP, Sanders S, Glasziou PP, Del Mar CB, Rovers MM. Antibiotics for acute otitis media in children. Cochrane Database Syst Rev. 2013 Jan 31;1:CD000219.	AAP guideline
Pediatric **Infectious disease** **Urologic**	Don't perform voiding cystourethrogram routinely in first febrile urinary tract infection in children aged two to 24 months. *American Academy of Family Physicians*	The risks associated with radiation (plus the discomfort and expense of the procedure) outweigh the risk of delaying the detection of the few children with correctable genitourinary abnormalities until their second urinary tract infection.	Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement and Management, Roberts KB. Urinary tract infection: clinical practice guideline for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. Pediatrics. 2011 Sep;128(3):595-610. American College of Radiology , Society for Pediatric Radiology, Society of Nuclear Medicine. ACR-SPR-SNM practice guideline for the performance of adult and pediatric radionuclide cystography [Internet]. Reston (VA): American College of Radiology; 2010. 5 p. National Institute for Health and Clinical Excellence, National Collaborating Centre for Women's and Children's Health (UK). Urinary tract infection in children: diagnosis, treatment and long-term management. London: RCOG Press; August 2007. 429 p. Westwood ME, Whiting PF, Cooper J, Watt IS, Kleijnen J. Further investigation of confirmed urinary tract infection (UTI) in children	AAP, ACR, and NICE guidelines

			under five years: a systematic review. BMC Pediatrics. 2005 Mar 15;5:2.	
Pediatric **Preventive Medicine**	Don't recommend nonfluoride toothpaste for infants and children. *American Dental Association*	The benefit of fluoride-containing toothpaste arises from its topical effect on dental enamel by interrupting enamel demineralization caused by bacterial acids and enhancing remineralization of the enamel surface. Anti-caries (anti-cavities) benefit begins with eruption of the first primary tooth. Brushing with nonfluoridated toothpaste provides no anti-caries benefit. Use of recommended amounts of fluoride toothpaste minimizes risks of fluorosis, a whitish discoloration of enamel.	American Academy of Pediatric Dentistry. Guideline on Fluoride Therapy. Pediatr Dent 2014;36(6): 171-74. American Dental Association Council on Scientific Affairs. Fluoride toothpaste use for young children. J Am Dent Assoc. 2014 Feb;145(2):190-1. Wright JT, Hanson N, Ristic H, Whall CW, Estrich CG, Zentz RR. Fluoride toothpaste efficacy and safety in children younger than 6 years: a systematic review. J Am Dent Assoc. 2014 Feb;145(2):182-9	Systematic review
Pediatric **Preventive medicine** **Orthopedic**	Don't screen adolescents for scoliosis. *American Academy of Family Physicians*	There is no good evidence that screening asymptomatic adolescents detects idiopathic scoliosis at an earlier stage than detection without screening. The potential harms of screening and treating adolescents include unnecessary follow-up visits and evaluations due to false-positive test results and psychological adverse effects.	American Academy of Family Physicians. Scoliosis [Internet]. Leawood (KS): American Academy of Family Physicians; 2004 [cited 2013 Jul 23]. Available from: http://www.aafp.org/patient-care/clinical-recommendations/all/scoliosis.html. U.S. Preventive Services Task Force. Screening for idiopathic scoliosis in adolescents. Rockville (MD): U.S. Preventive Services Task Force. 2004 Jun. 3 p.	USPSTF
Pediatric **Ophthal-mologic**	Don't recommend vision therapy for patients with dyslexia. *American Association for Pediatric Ophthalmology and Strabismus*	Dyslexia is a language-based learning disorder in which a person has trouble understanding written words. This occurs because the brain has a problem distinguishing and separating the sounds in spoken words, called a phonological deficit. Dyslexia is not due to a vision disorder. Children with dyslexia do not have any more visual problems than children without dyslexia. Vision therapy does not work for this population because the eyes are not the problem.	Shaywitz SE. Overcoming dyslexia: a new and complete science-based program for overcoming reading problems at any level. New York, NY: Knopf; 2003. Jennings AJ. Behavioural optometry—a critical review. Optom Pract. 2000;1:67-78. Barrett B. A critical evaluation of the evidence supporting the practice of behavioural vision therapy. Ophthalmic Physiol Opt. 2009;29:4-25. Fletcher JM, Currie D. Vision efficiency interventions and reading disability. Perspectives on Language and Literacy. 2011;37:21-4. Handler SM, Fierson WM; Section on Ophthalmology and Council on Children with Disabilities, American Academy of Ophthalmology, American Association for Pediatric Ophthalmology and Strabismus, American Association of Certified Orthoptists. Joint technical report—learning disabilities, dyslexia, and vision. Pediatrics. 2011;127:e818-56. Available at: http://pediatrics.aappublications.org/content/127/3/e818.full.pdf+html	American Academy of Ophthalmology/ American Association for Pediatric Ophthalmology and Strabismus /American Association of Certified Orthoptists guideline

Pediatric **Emergency medicine**	Avoid instituting IV fluids before doing a trial of oral rehydration therapy in uncomplicated emergency department cases of mild to moderate dehydration in children. *American College of Emergency Physicians*	Many children who come to the emergency department with dehydration require fluid replacement. To avoid the pain and potential complications of an IV catheter, it is preferable to give these fluids by mouth. Giving a medication for nausea may allow patients with nausea and vomiting to accept fluid replenishment orally. This strategy can eliminate the need for an IV. It is best to give these medications early during the emergency department visit, rather than later, in order to allow time for them to work optimally.	Szajewska H, Gieruszcak-Bialek D, Dylag M. Meta-analysis: ondansetron for vomiting in acute gastroenteritis in children. Aliment Pharmacol Ther. 2007;25:393-400. Roslund G, Hepps T, McQuillen K. The role of oral ondanestron in children with vomiting as a result of acute gastritis/gastroenteritis who have failed oral rehydration therapy: a randomized controlled trial. Ann Emerg Med. 2008;52(1); 22-9. Hartling L, Bellemare S, Wiebe N, Russell K, Klassen TP, Craig W. Oral versus intravenous rehydration for treating dehydration due to gastroenteritis in children. Cochrane Database System Rev. 2006;19(3):CD004390.	Cochrane Database of Systematic Reviews
Pediatric	Infant home apnea monitors should not be routinely used to prevent sudden infant death syndrome. *American Academy of Pediatrics*	There is no evidence that the use of infant home apnea monitors decreases the incidence of sudden infant death syndrome; however, they might be of value for selected infants at risk for apnea or cardiovascular events after discharge but should not be used routinely.	Moon RY; American Academy of Pediatrics Task Force on Sudden Infant Death Syndrome. SIDS and other sleep-related infant deaths: expansion of recommendations for a safe infant sleeping environment. Pediatrics. 2011 Nov;128(5):1030–9.	Expert consensus
Pediatric	Don't prescribe medication to treat childhood insomnia, which usually arises from parent-child interactions and responds to behavioral intervention. *American Academy of Sleep Medicine*	No medications are approved by the U.S. Food and Drug Administration for the treatment of pediatric insomnia. Because childhood insomnia usually arises due to parent-child interactions, treatment should involve efforts to improve relevant parent and child behavior, establish better sleep hygiene, and manage expectations. Basic environmental, scheduling, sleep practice, and physiological features should be optimized before hypnotic use is considered for children. When necessary, hypnotics should be used short term, with caution and close monitoring for efficacy and side effects. Some children with significant developmental delay or cognitive impairment may not respond to behavioral management and may benefit from judicious use of hypnotics.	Owens JA, Babcock D, Blumer J, Chervin R, Ferber R, Goetting M, Glaze D, Ivanenko A, Mindell J, Rappley M, Rosen C, Sheldon S. The use of pharmacotherapy in the treatment of pediatric insomnia in primary care: rational approaches. A consensus meeting summary. J Clin Sleep Med. 2005;1(1):49-59. Owens JA, Mindell JA. Pediatric Insomnia. Pediatr Clin N Am. 2011;58(3):555-69. Sheldon SH, Ferber R, Kryger MH, Gozal D, eds. Principles and Practice of Pediatric Sleep Medicine: second edition. London: Elsevier Saunders; 2012.	Expert consensus

Topic area(s)	Recommendation	Rationale and comments	References	Source
Preventive medicine **Gynecologic** **Oncologic**	Don't perform routine annual cervical cytology screening (Pap tests) in women 30 to 65 years of age. *American College of Obstetricians and Gynecologist*	In average-risk women, annual cervical cytology screening has been shown to offer no advantage over screening performed at three-year intervals. However, a well-woman visit should occur annually for patients with their health care provider to discuss concerns, problems, and have appropriate screening, with consideration of a pelvic examination.	Boulware LE, et al. Systematic review: the value of the periodic health evaluation. Ann Intern Med. 2007;146:289-300. Saslow D, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. CA Cancer J Clin. 2012;62:147-72. American College of Obstetricians and Gynecologists. Well-woman visit. Committee opinion no. 534. Obstet Gynecol 2012;120:421-4. American College of Obstetricians and Gynecologists. Screening for cervical cancer. Practice bulletin no. 131. Obstet Gynecol. 2012;120(5):122-38.	ACS/ASCCP/ ASCP, ACOG guidelines
Preventive medicine **Gynecologic** **Oncologic**	Don't screen women younger than 30 years for cervical cancer with HPV testing, alone or in combination with cytology. *American Academy of Family Physicians*	There is adequate evidence that the harms of HPV testing, alone or in combination with cytology, in women younger than 30 years are moderate. The harms include more frequent testing and invasive diagnostic procedures such as colposcopy and cervical biopsy. Abnormal screening test results are also associated with psychological harms, anxiety, and distress.	American Academy of Family Physicians. Screening for cervical cancer policy. http://www.aafp.org/online/en/home/clinical/exam/cervicalcancer.html. U.S. Preventive Services Task Force. Screening for cervical cancer. http://www.uspreventiveservicestaskforce.org/uspstf/ uspscerv.htm. Vesco KK, et al. Screening for cervical cancer: a systematic evidence review for the U.S. Preventive Services Task Force. Rockville, Md.: Agency for Healthcare Research and Quality; 2011. http://preview.ncbi.nlm.nih.gov/bookshelf/booktest/br.fcgi?book=es86.	USPSTF
Preventive medicine **Gynecologic Oncologic**	Don't screen women older than 65 years for cervical cancer who have had adequate prior screening and are not otherwise at high risk for cervical cancer. *American Academy of Family Physicians*	There is adequate evidence that screening women older than 65 years for cervical cancer who have had adequate prior screening and are not otherwise at high risk provides little to no benefit.	American Academy of Family Physicians. Screening for cervical cancer policy. http://www.aafp.org/online/en/home/clinical/exam/cervicalcancer.html U.S. Preventive Services Task Force. Screening for cervical cancer. http://www.uspreventiveservicestaskforce.org/uspstf/ uspscerv.htm. Vesco KK, et al. Screening for cervical cancer: a systematic evidence review for the U.S. Preventive Services Task Force. Rockville, Md.: Agency for Healthcare Research and Quality; 2011. http://preview.ncbi.nlm.nih.gov/bookshelf/booktest/br.fcgi?book=es86.	USPSTF
Preventive medicine **Gynecologic** **Oncologic**	Don't perform Pap tests in patients younger than 21 years or in women after hysterectomy for benign disease. *American Academy of Family Physicians*	Most dysplasia in adolescents regresses spontaneously; therefore, screening Pap tests in this age group can lead to unnecessary anxiety, morbidity, and cost. Pap tests have low yield in women after hysterectomy for benign disease, and there is poor evidence for improved outcomes.	U.S. Preventive Services Task Force American College of Obstetricians and Gynecologists	ACOG (for age), USPSTF (for hysterectomy)

Preventive medicine **Gynecologic** **Oncologic**	Don't screen for ovarian cancer in asymptomatic women at average risk. *American College of Obstetricians and Gynecologists*	In population studies, there is only fair evidence that screening of asymptomatic women with serum cancer antigen 125 level and/or transvaginal ultrasound can detect ovarian cancer at an earlier stage than it can be detected in the absence of screening. Because of the low prevalence of ovarian cancer and the invasive nature of interventions required after a positive screening test, the potential harms of screening outweigh the potential benefits.	Screening for ovarian cancer: recommendation statement. Ann Fam Med. 2004;2:260-2. Barton MB, et al. Screening for ovarian cancer: evidence update for the U.S. Preventive Services Task Force reaffirmation recommendation statement. AHRQ publication no. 12-05165-EF3. Rockville, Md.: Agency for Healthcare Research and Quality; April 2012. Partridge E, et al. Results from four rounds of ovarian cancer screening in a randomized trial. Obstet Gynecol 2009;113:775-82. American College of Obstetricians and Gynecologists. The role of the obstetrician–gynecologist in the early detection of epithelial ovarian cancer. Committee opinion no. 477. Obstet Gynecol. 2011;117:742-6.	USPSTF
Preventive medicine **Oncologic** **Gynecologic**	Don't routinely use breast MRI for breast cancer screening in average risk women. *Society of Surgical Oncology*	MRI screening should be reserved for those at increased risk. Women considered at high risk include: known *BRCA* gene mutation carriers; first-degree relatives of known *BRCA* gene mutation carriers; those with a lifetime risk exceeding 20% as measured by risk-assessment tools based primarily on family history of breast cancer; and those with a clinical history associated with a significant risk for breast cancer, including women who received mantle radiation before the age of 30.	Saslow D, Boetes C, Burke W, Harms S, Leach MO, Lehman CD, Morris E, Pisano E, Schnall M, Sener S, Smith RA, Warner E, Yaffe M, Andrews KS, Russell CA; American Cancer Society Breast Cancer Advisory Group. American Cancer Society guidelines for breast screening with MRI as an adjunct to mammography. CA Cancer J Clin. 2007 Mar-Apr;57(2):75-89. Erratum in: CA Cancer J Clin. 2007 May-Jun;57(3):185. Mulder RL, Kremer LC, Hudson MM, Bhatia S, Landier W, Levitt G, Constine LS, Wallace WH, van Leeuwen FE, Ronckers CM, Henderson TO, Dwyer M, Skinner R, Oeffinger KC; International Late Effects of Childhood Cancer Guideline Harmonization Group. Recommendations for breast cancer surveillance for female survivors of childhood, adolescent, and young adult cancer given chest radiation: a report from the International Late Effects of Childhood Cancer Guideline Harmonization Group. Lancet Oncol. 2013 Dec;14(13):e621-9.	ACS guideline
Preventive medicine **Oncologic**	Don't use positron emission tomography/CT for cancer screening in healthy individuals. *Society of Nuclear Medicine and Molecular Imaging*	The likelihood of finding cancer in healthy adults is extremely low (around 1%), based on studies using positron emission tomography/CT for screening. Imaging without clear clinical indication is likely to identify harmless findings that lead to more tests, biopsy, or unnecessary surgery.	Lee JW, et al. Cancer screening using 18F-FDG PET/CT in Korean asymptomatic volunteers: a preliminary report. Ann Nucl Med. 2009;23(7):685-91. Minamimoto R, et al. Analysis of various malignant neoplasms detected by FDG-PET cancer screening program: based on a Japanese Nationwide Survey. Ann Nucl Med. 2011;25(1):45-54.	Expert consensus

Preventive medicine **Nephrologic** **Oncologic**	Don't perform routine cancer screening for dialysis patients with limited life expectancies without signs or symptoms. *American Society of Nephrology*	Due to high mortality among end-stage renal disease patients, routine cancer screening—including mammography, colonoscopy, prostate-specific antigen, and Pap smears—in dialysis patients with limited life expectancy, such as those who are not transplant candidates, is not cost-effective and does not improve survival. False-positive tests can cause harm: unnecessary procedures, overtreatment, misdiagnosis, and increased stress. An individualized approach to cancer screening incorporating patients' cancer risk factors, expected survival, and transplant status is required.	U.S. Renal Data System. http://www.usrds.org. American Society of Nephrology American Society of Transplantation Archives of Internal Medicine Seminars in Dialysis	American Society of Nephrology
Preventive medicine **Gastro-enterologic** **Oncologic**	Don't repeat colorectal cancer screening (by any method) for 10 years after a high-quality colonoscopy is negative in average-risk individuals. *American Gastroenterological Association*	A screening colonoscopy every 10 years is the recommended interval for adults without increased risk of colorectal cancer, beginning at 50 years of age. Published studies indicate the risk of cancer is low for 10 years after a high-quality colonoscopy fails to detect neoplasia in this population. Therefore, following a high-quality colonoscopy with normal results the next interval for any colorectal screening should be 10 years following that normal colonoscopy.	Winawer S, et. al. Colorectal cancer screening and surveillance: clinical guidelines and rationale—update based on new evidence. Gastroenterology. 2003;124(2):544-60. Rex DK, et. al. Quality indicators for colonoscopy. Gastrointest Endosc. 2006;63(4 suppl):S16-28.	U.S. Multi-Society Task Force on Colorectal Cancer
Preventive medicine **Rheumatologic**	Don't use DEXA to screen for osteoporosis in women younger than 65 years or in men younger than 70 years with no risk factors. NOTE: *Risk factors include, but are not limited to, fractures after 50 years of age, prolonged exposure to corticosteroids, diet deficient in calcium or vitamin D, cigarette smoking, alcoholism,*	Not cost-effective in younger, low-risk patients, but cost-effective in older patients.	U.S. Preventive Services Task Force American Association of Clinical Endocrinology American College of Preventive Medicine National Osteoporosis Foundation	American Association of Clinical Endocrinologists, American College of Preventive Medicine, NOF, USPSTF

	and thin/small build. *American Academy of Family Physicians*			
Preventive medicine **Rheumatologic**	Don't routinely repeat DEXA scans more often than once every two years. *American College of Rheumatology*	Initial screening for osteoporosis should be performed according to NOF recommendations. The optimal interval for repeating DEXA scans is uncertain, but because changes in bone density over short intervals are often smaller than the measurement error of most DEXA scanners, frequent testing (e.g., < 2 years) is unnecessary in most patients. Even in high-risk patients receiving drug therapy for osteoporosis, DEXA changes do not always correlate with probability of fracture. Therefore, DEXA should only be repeated if the result will influence clinical management or if rapid changes in bone density are expected. Recent evidence also suggests that healthy women 67 years and older with normal bone mass may not need additional DEXA testing for up to 10 years provided osteoporosis risk factors do not significantly change.	Grossman JM, et al. American College of Rheumatology 2010 recommendations for the prevention and treatment of glucocorticoid-induced osteoporosis. Arthritis Care Res (Hoboken). 2010;62(11):1515-26. Clinician's guide to prevention and treatment of osteoporosis., Washington, D.C.: National Osteoporosis Foundation; 2008:1–36. U.S. Preventive Services Task Force. Screening for osteoporosis: recommendation statement. Ann Intern Med;154(5):356-64.	USPSTF, NOF
Preventive medicine **Endocrinologic**	Don't perform population-based screening for 25-OH-vitamin D deficiency. *American Society for Clinical Pathology*	Vitamin D deficiency is common in many populations, particularly in patients at higher latitudes, during winter months, and in those with limited sun exposure. Over-the-counter vitamin D supplements and increased summer sun exposure are sufficient for most otherwise healthy patients. Laboratory testing is appropriate in higher risk patients when results will be used to institute more aggressive therapy (e.g., osteoporosis, chronic kidney disease, malabsorption, some infections, obese individuals).	Sattar N, et al. Increasing requests for vitamin D measurement: costly, confusing, and without credibility. Lancet. 2012;379:95-6. Bilinski K, et al. The rising cost of vitamin D testing in Australia: time to establish guidelines for testing. Med J Aust. 2012;197(2):90. Lu C. Pathology consultation on vitamin D testing: clinical indications for 25(OH) vitamin D measurement [letter to the editor]. Am J Clin Pathol. 2012;137:831. Holick M, et al. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. J Clin Endocrinol Metab. 2011;96(7):1911-30.	Endocrine Society guideline
Preventive medicine **Neurologic**	Don't screen for carotid artery stenosis in asymptomatic adult patients.	There is good evidence that for adult patients with no symptoms of carotid artery stenosis the harms of screening outweigh the benefits. Screening could lead to nonindicated surgeries	American Academy of Family Physicians. Screening for carotid artery stenosis policy. http://www.aafp.org/online/en/home/clinical/exam/carotidartery.html.	USPSTF

	American Academy of Family Physicians	that result in serious harms, including death, stroke, and myocardial infarction.	U.S. Preventive Services Task Force. Screening for carotid artery stenosis. http://www.uspreventiveservicestaskforce.org/uspstf/uspsacas.htm. Wolff T, et al. Screening for asymptomatic carotid artery stenosis. Evidence synthesis no. 50. Rockville, Md.: Agency for Healthcare Research and Quality; 2007. http://www.ncbi.nlm.nih.gov/books/NBK33504/.	
Preventive medicine **Gastro-enterologic** **Geriatric**	Avoid colorectal cancer screening tests on asymptomatic patients with a life expectancy of less than 10 years and no family or personal history of colorectal neoplasia. *American College of Surgeons*	Screening for colorectal cancer has been shown to reduce the mortality associated with this common disease; colonoscopy provides the opportunity to detect and remove adenomatous polyps, the precursor lesion to many cancers, thereby reducing the incidence of the disease later in life. However, screening and surveillance modalities are inappropriate when the risks exceed the benefit. The risk of colonoscopy increases with increasing age and comorbidities. The risk/benefit ratio of colorectal cancer screening or surveillance for any patient should be individualized based on the results of previous screening examinations, family history, predicted risk of the intervention, life expectancy, and patient preference.	Lieberman DA, Rex DK, Winawer SJ, Giardiello FM, Johnson DA, Levin TR; United States Multi-Society Task Force on Colorectal Cancer. Guidelines for colonoscopy surveillance after screening and polypectomy: a consensus update by the US Multi-Society Task Force on Colorectal Cancer. Gastroenterology. 2012;143(3):844-57. Warren JL, Klabunde CN, Mariotto AB, Meekins A, Topor M, Brown ML, Ransohoff DF. Adverse events after outpatient colonoscopy in the Medicare population. Ann Intern Med. 2009;150(12):849-57. U.S. Preventive Services Task Force. Screening for colorectal cancer: US Preventive Services Task Force Recommendation Statement. Ann Intern Med. 2008;149(9)627-37. Qaseem A, Denberg TD, Hopkins RH, Humphrey LL, Levine J, Sweet DE, Shekelle P; Clinical Guidelines Committee of the American College of Physicians. Screening for colorectal cancer; a guidance statement from the American College of Physicians. Ann Intern Med. 2012;156(5);378-86.	U.S. Multi-Society Task Force on Colorectal Cancer, USPSTF
Preventive medicine	Don't perform routine general health checks for asymptomatic adults. *Society of General Internal Medicine*	Routine general health checks are office visits between a health professional and a patient exclusively for preventive counseling and screening tests. In contrast to office visits for acute illness, specific evidence-based preventive strategies, or chronic care management such as treatment of high blood pressure, regularly scheduled general health checks without a specific cause including the "health maintenance" annual visit, have not shown to be effective in reducing morbidity, mortality or hospitalization, while creating a potential for harm from unnecessary testing.	Krogsboll LT, Jorgensen KJ, Gronhoj Larsen C, Gotzsche PC. General health checks in adults for reducing morbidity and mortality from disease: Cochrane systematic review and meta-analysis. BMJ. 2012;345:e7191. Boulware LE, Marinopoulos S, Phillips KA, Hwang CW, Maynor K, Merenstein D, Wilson RF, Barnes GJ, Bass EB, Powe NR, Daumit GL. Systematic review: the value of the periodic health evaluation. Ann Intern Med. 2007 Feb 20;146(4):289-300. United States Preventive Services Task Force. Guide to clinical preventative services: an assessment of the effectiveness of 169 interventions. Baltimore: Williams & Wilkins, 1989. Candian Task Force on the Periodic Health Examination. The periodic health examination. CMAJ. 1979;121(9):1193-254.	Cochrane Database of Systematic Reviews
Preventive medicine	Don't recommend cancer screening in adults with	Screening for cancer can be lifesaving in otherwise healthy at-risk patients. While	Lee SJ, Boscardin WJ, Stijacic-Cenzer I, Conell-Price J, O'Brien S, Walter LC. Time lag to benefit after screening for breast and colorectal	USPSTF

Geriatric	life expectancy of less than 10 years. *Society of General Internal Medicine*	screening tests lead to a mortality benefit, which emerges years after the test is performed, they expose patients to immediate potential harms. Patients with life expectancies of less than 10 years are unlikely to live long enough to derive the distant benefit from screening. However, these patients are in fact more likely to experience the harms since patients with limited life expectancy are more likely to be frail and more susceptible to complications of testing and treatments. Therefore, the balance of potential benefits and harms does not favor recommending cancer screening in patients with life expectancies of less than 10 years.	cancer: meta-analysis of survival data from the United States, Sweden, United Kingdom, and Denmark. BMJ. 2012 Jan 8;345:e8441. Moyer VA, U.S. Preventive Services Task Force. Screening for prostate cancer: U.S. Preventive Services Task Force Recommendation Statement. Ann Intern Med. 2012 Jul 17;157(2):120-34. Schröder FS, Hugosson J, Roobol, MJ, Tammela TL, Ciatto S, Nelen V, Kwiatkowski M, Lujan M, Lilja H, Zappa M, Denis LJ, Recker F, Páez A, Määttänen L, Bangma CH, Aus G, Carlsson S, Villers A, Rebillard X, van der Kwast T, Kujala PM, Blijenberg BG, Stenman UH, Huber A, Taari K, Hakama M, Moss SM, de Koning HJ, Auvinen A; ERSPC Investigators. Prostate-cancer mortality at 11 years of follow-up. N Engl J Med. 2012 Mar 15;366(11):981-90. Whitlock EP, Lin JS, Liles E, Beil TL, Fu R. Screening for colon cancer: a targeted updated systematic review for the U.S. Preventive Services Task Force. Ann Intern Med. 2008 Nov 4;149(9):638-58. Walter LC and Covinsky KE. Cancer screening in elderly patients: a framework for individualized decision making. JAMA. 2001 Jun 6;285(21):2750-6.	
Preventive medicine **Urologic** **Oncologic**	Don't routinely screen for prostate cancer using a PSA test or digital rectal exam. *American Academy of Family Physicians*	There is convincing evidence that PSA-based screening leads to substantial overdiagnosis of prostate tumors. Many tumors will not harm patients, while the risks of treatment are significant. Physicians should not offer or order PSA screening unless they are prepared to engage in shared decision making that enables an informed choice by patients.	American Academy of Family Physicians. Prostate cancer [Internet]. Leawood (KS): American Academy of Family Physicians; 2012 [cited 2013 Jul 23]. Available from: http://www.aafp.org/patient-care/clinical-recommendations/all/prostate-cancer.html. U.S. Preventive Services Task Force. Screening for prostate cancer. Rockville (MD): U.S. Preventive Services Task Force. 2012 May. 16 p.	USPSTF
Preventive medicine	Don't routinely measure 1,25-dihydroxyvitamin D unless the patient has hypercalcemia or decreased kidney function. *The Endocrine Society* *American Association of Clinical Endocrinologists*	Many practitioners become confused when ordering a vitamin D test. Because 1,25-dihydroxyvitamin D is the active form of vitamin D, many practitioners think that measuring 1,25-dihydroxyvitamin D is an accurate means to estimate vitamin D stores and test for vitamin D deficiency, which is incorrect. Current Endocrine Society guidelines recommend screening for vitamin D deficiency in individuals at risk for deficiency. Serum levels of 1,25-dihyroxyvitamin D have little or no relationship to vitamin D stores but rather are regulated primarily by parathyroid hormone	Bikle D, Adams J, Christakos S. Primer on the metabolic bone diseases and disorders of mineral metabolism. Washington: American Society for Bone and Mineral Research. c2008.Chapter 28, Vitamin D: production, metabolism, mechanism of action, and clinical requirements. p. 141-9. Holick MF. Vitamin D deficiency. N Engl J Med. 2007;357:266-81. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP, Murad MH, Weaver CM; Endocrine Society. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. J Clin Endocrinol Metab. 2011 Jul;96(7):1911-30.	Endocrine Society Guideline

		levels, which in turn are regulated by calcium and/or vitamin D. In vitamin D deficiency, 1,25-dihydroxyvitamin D levels go up, not down. Unregulated production of 1,25-dihydroxyvitamin D (i.e., sarcoidosis, granulomatous diseases) is an uncommon cause of hypercalcemia; this should be suspected if blood calcium levels are high and parathyroid hormone levels are low and confirmed by measurement of 1,25-dihydroxyvitamin D. The enzyme that activates vitamin D is produced in the kidney, so blood levels of 1,25-dihydroxyvitamin D are sometimes of interest in patients on dialysis or with end-stage kidney disease. There are few other circumstances, if any, where 1,25-dihydroxyvitamin D testing would be helpful. Serum 25-hydroxyvitamin D levels may be overused, but when trying to assess vitamin D stores or diagnose vitamin D deficiency (or toxicity), 25-hydroxyvitamin D is the correct test.		
Preventive medicine **Oncologic** **Gynecologic**	Don't screen low-risk women with cancer antigen (CA) 125 or ultrasound for ovarian cancer. *Society of Gynecologic Oncology*	CA-125 and ultrasound in low-risk, asymptomatic women have not led to diagnosis of ovarian cancer in earlier stages of disease or reduced ovarian cancer mortality. False-positive results of either test can lead to unnecessary procedures, which have risks of complication.	Barton MB, Lin K. Screening for ovarian cancer: Evidence update for the U.S. Preventive Services Task Force reaffirmation recommendation statement [Internet]. Rockville (MD); 2012 Apr. Agency for Healthcare Research and Quality; AHRQ Publication No. 12-05165–EF3. Available from: http://www.uspreventiveservicestaskforce.org/uspstf12/ovarian/ovarcancerrs.htm. Buys SS, Partridge E, Black A, Johnson CC, Lamerato L, Isaacs C, Reding DJ, Greenlee RT, Yokochi LA, Kessel B, Crawford ED, Church TR, Andriole GL, Weissfeld JL, Fouad MN, Chia D, O'Brien B, Ragard LR, Clapp JD, Rathmell JM, Riley TL, Hartge P, Pinsky PF, Zhu CS, Izmirlian G, Kramer BS, Miller AB, Xu JL, Prorok PC, Gohagan JK, Berg CD; PLCO Project Team. Effect of screening on ovarian cancer mortality: the Prostate, Lung, Colorectal and Ovarian (PLCO) cancer screening randomized controlled trial. JAMA. 2011 Jun 8;305(22):2295-303. American College of Obstetricians and Gynecologists Committee on Gynecologic Practice. The role of the obstetrician-gynecologist in the early detection of epithelial ovarian cancer. Committee Opinion No.	USPSTF

			477. Obstet Gynecol. 2011 Mar;117(3):742-6.	
Preventive medicine **Oncologic** **Gynecologic**	Don't perform pelvic ultrasound in average risk women to screen for ovarian cancer. *ACOG*	Although the mortality rate associated with ovarian cancer is high, the disease occurs infrequently in the general U.S. population, with an age-adjusted incidence of 13 cases per 100,000 women. As a result, the positive predictive value of screening for ovarian cancer is low, and most women with a positive screening test result will have a false-positive result. Annual screening with transvaginal ultrasonography in women does not reduce the number of ovarian cancer deaths.	Moyer VA. Screening for ovarian cancer: U.S. Preventive Services Task Force reaffirmation recommendation statement. U.S. Preventive Services Task Force. Ann Intern Med 2012;157:900–4. American College of Obstetricians and Gynecologists Committee on Gynecologic Practice. Committee Opinion No. 477: the role of the obstetrician-gynecologist in the early detection of epithelial ovarian cancer. Obstet Gynecol. 2011 Mar;117(3):742-6. U.S. Preventive Services Task Force. Ovarian cancer: screening. Rockville (MD): USPSTF; 2012. Available at: http://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/ovarian-cancer-screening. Retrieved December 9, 2015.	USPSTF
Preventive medicine **Urologic** **Oncologic**	Don't perform PSA testing for prostate cancer screening in men with no symptoms of the disease when they are expected to live less than 10 years. *American Society of Clinical Oncology*	Since PSA levels in the blood have been linked with prostate cancer, many doctors have used repeated PSA tests in the hope of finding "early" prostate cancer in men with no symptoms of the disease. Unfortunately, PSA is not as useful for screening as many have hoped because many men with prostate cancer do not have high PSA levels, and other conditions that are not cancer (such as benign prostate hyperplasia) can also increase PSA levels. Research has shown that men who receive PSA testing are less likely to die specifically from prostate cancer. However when accounting for deaths from all causes, no lives are saved, meaning that men who receive PSA screening have not been shown to live longer than men who do not have PSA screening. Men with medical conditions that limit their life expectancy to less than 10 years are unlikely to benefit from PSA screening as their probability of dying from the underlying medical problem is greater than the chance of dying from asymptomatic prostate cancer.	Raghavan D. PSA – Please Stop Agonizing (over prostate-specific antigen interpretation). Mayo Clin Proc. 2013 Jan;88:1-3. Schroder FH, Hugosson J, Roobol MJ, Tammela TL, Ciatto S, Nelen V, Kwiatkowski M, Lujan M, Lilja H, Zappa M, Denis LJ, Recker F, Páez A, Määttänen L, Bangma CH, Aus G, Carlsson S, Villers A, Rebillard X, van der Kwast T, Kujala PM, Blijenberg BG, Stenman UH, Huber A, Taari K, Hakama M, Moss SM, de Koning HJ, Auvinen A; ERSPC Investigators. Prostate-cancer mortality at 11 years of follow-up. N Engl J Med. 2012 Mar 15;366(11):981-90. Hugosson J, Carlsson S, Aus G, Bergdahl S, Khatami A, Lodding P, Pihl C-G, Stranne J, Holmberg E, Lilja H. Mortality results from the Goteborg randomized population based prostate-cancer screening trial. Lancet Oncol. 2010 Aug;11(8):725-32. Andriole GL, Crawford ED, Grubb RL III, Buys SS, Chia D, Church TR, Fouad MN, Gelmann EP, Kvale PA, Reding DJ, Weissfeld JL, Yokochi LA, O'Brien B, Clapp JD, Rathmell JM, Riley TL, Hayes RB, Kramer BS, Izmirlian G, Miller AB, Pinsky PF, Prorok PC, Gohagan JK, Berg CD; PLCO Project Team. Mortality results form a randomized prostate-cancer screening trial. N Engl J Med. 2009 Mar 26;360(1):1310-9. Moyer VA; U.S. Preventive Services Task Force. Screening for prostate cancer: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2012 Jul 17;157(2):1-15. Qaseem A, Barry MJ, Denberg TD, Owens DK, Shekelle P; Clinical Guidelines Committee of the American College of Physicians. Screening for prostate cancer: A guidance statement from the Clinical	USPSTF, American College of Physicians and AUA guidelines

			Guidelines Committee of the American College of Physicians. Ann Intern Med. 2013 May 21;158(10):761-9. Carter HB, Albertson PC, Barry MJ, Etzioni R, Freedland SJ, Greene KL, Holmberg L, Kantoff P, Konety BR, Murad MH, Penson DF, Zietman AL. Early detection of prostate cancer: AUA Guideline. J Urol. 2013 Aug;190(2):419-26. Basch E, Oliver TK, Vickers A, Thompson I, Kantoff P, Parnes H, Loblaw DA, Roth B, Williams J, Nam RK. Screening for prostate cancer with prostate-specific antigen testing: American Society of Clinical Oncology provisional clinical opinion. J Clin Oncol. 2012 Aug 20;30(24):3020-5.	
Preventive medicine **Oncologic** **Pulmonary medicine**	Don't perform CT screening for lung cancer among patients at low risk for lung cancer. *American College of Chest Physicians* *American Thoracic Society*	Low dose chest CT screening for lung cancer has the potential to reduce lung cancer death in patients at high risk (i.e., individuals aged 55 to 74 with at least a 30-pack-year history of tobacco use, who are either still smoking or quit within the past 15 years). However, CT screening for lung cancer also has the potential to cause a number of adverse effects (e.g., radiation exposure, high false-positive rate, harms related to downstream evaluation of pulmonary nodules, overdiagnosis of indolent tumors). Thus, screening should be reserved for patients at high risk of lung cancer and should not be offered to individuals at low risk of lung cancer.	Aberle DR, Adams AM, Berg CD, Black WC, Clapp JD, Fagerstrom RM, Gareen IF, Gatsonis C, Marcus PM, Sicks JD. Reduced lung-cancer mortality with low-dose computed tomographic screening. N Engl J Med. 2011;365(5):395-409. Bach PB, Mirkin JN, Oliver TK, Azzoli CG, Berry DA, Brawley OW, Byers T, Colditz GA, Gould MK, Jett JR, Sabichi AL, Smith-Bindman R, Wood DE, Qaseem A, Detterbeck FC. Benefits and harms of CT screening for lung cancer: a systematic review. JAMA. 2012;307(22):2418-29. Veronesi G, Maisonneuve P, Bellomi M, Rampinelli C, Durli I, Bertolotti R, Spaggiari L. Estimating overdiagnosis in low-dose computed tomography screening for lung cancer: a cohort study. Ann Intern Med. 2012;157(11):776-84. Humphrey LL, Deffebach M, Pappas M, Baumann C, Artis K, Mitchell JP, Zakher B, Fu R, Slatore CG. Screening for lung cancer with low-dose computed tomography: a systematic review to update the U.S. Preventive Services Task Force recommendation. Ann Intern Med. 2013 Sep 17;159(6):411-20.	USPSTF
Preventive Medicine	Don't order low back x-rays as part of a routine preplacement medical examination. *American College of Occupational and Environmental Medicine*	Preplacement medical examinations are conducted to determine an individual's ability to perform the job's essential functions. Routine low back x-rays are costly, result in unnecessary radiation exposure, do not address the worker's abilities and do not predict future injuries.	Talmage J, Belcourt R, Galper J, et al. Low back disorders. In: Hegmann K, ed. Occupational Medicine Practice Guidelines. 3rd ed. Elk Grove Village, Ill: American College of Occupational and Environmental Medicine; 2011. p. 377.	ACOEM guideline
Preventive Medicine	Don't recommend screening for breast or colorectal cancer, nor	Cancer screening is associated with short-term risks, including complications from testing, overdiagnosis and treatment of tumors that	Schröder FH, Hugosson J, Roobol MJ, Tammela TL, Ciatto S, Nelen V, Kwiatkowski M, Lujan M, Lilja H, Zappa M, Denis LJ, Recker F, Páez A, Määttänen L, Bangma CH, Aus G, Carlsson S,Villers A,	USPSTF

Oncologic **Geriatric**	prostate cancer (with the PSA test) without considering life expectancy and the risks of testing, overdiagnosis, and overtreatment. *American Geriatrics Society*	would not have led to symptoms. For prostate cancer, 1,055 men would need to be screened and 37 would need to be treated to avoid one death in 11 years. For breast and colorectal cancer, 1,000 patients would need to be screened to prevent one death in 10 years. For patients with a life expectancy under 10 years, screening for these three cancers exposes them to immediate harms with little chance of benefit.	Rebillard X, van der Kwast T, Kujala PM, Blijenberg BG, Stenman UH, Huber A, Taari K, Hakama M, Moss SM, de Koning HJ, Auvinen A; ERSPC Investigators.Prostate-cancer mortality at 11 years of follow-up. N Engl J Med. 2012 Mar 15;366(11):981–90. Moyer VA; U.S. Preventive Services Task Force. Screening for prostate cancer: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2012 July 17;157(2):120–34. Walter LC, Covinsky KE. Cancer screening in elderly patients: a framework for individualized decision making. JAMA. 2001 Jun 6;285(21):2750–6. Lee SJ, Boscardin WJ, Stijacic-Cenzer I, Conell-Price J, O'Brien S, Walter LC. Time lag to benefit after screening for breast and colorectal cancer: meta-analysis of survival data from the United States, Sweden, United Kingdom, and Denmark. BMJ. 2012 Jan 8;346:e8441.	
Preventive Medicine **Allergy and Immunologic**	Don't routinely avoid influenza vaccination in egg-allergic patients. *American Academy of Allergy, Asthma & Immunology*	Of the vaccines that may contain egg protein (measles, mumps, rabies, influenza and yellow fever), measles, mumps and rabies vaccines have at most negligible egg protein; consequently no special precautions need to be followed in egg-allergic patients for these vaccines. Studies in egg-allergic patients receiving egg-based inactivated influenza vaccine have not reported reactions; consequently egg-allergic patients should be given either egg-free influenza vaccine or should receive egg-based influenza vaccine with a 30-minute post-vaccine observation period. Egg-allergic patients receiving the yellow fever vaccine should be skin tested with the vaccine and receive the vaccine with a 30-minute observation period if the skin test is negative. If positive, the vaccine may be given in graded doses with appropriate medical observation. Egg protein is present in influenza and yellow fever vaccines and in theory could cause reactions in egg-allergic patients. However, in 27 published studies collectively 4,172 patients with egg allergy received 4,729 doses of egg-based inactivated influenza vaccine with no cases of anaphylaxis, including 513 with severe egg	Des Roches A, Paradis L, Gagnon R, Lemire C, Bégin P, Carr S, Chan ES, Paradis J, Frenette L, Ouakki M, Benoît M, De Serres G; PCIRN (Public Health Agency of Canada/Canadian Institutes of Health Research Influenza Research Network). Egg-allergic patients can be safely vaccinated against influenza. J Allergy Clin Immunol. 2012 Nov;130(5):1213–1216. Centers for Disease Control and Prevention (CDC). Prevention and control of influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP)–United States, 2012–13 influenza season. MMWR Morb Mortal Wkly Rep. 2012 Aug 17;61(32):613–8. FLUCELVAX (Novartis) Package Insert. 2012. FLUBLOK (Protein Sciences) Package Insert. 2013. American Academy of Pediatrics. Red Book: 2012 report of the Committee on Infectious Diseases. Pickering LK, ed. 29th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2012. 936 p. Kelso JM, Greenhawt MJ, Li JT, Nicklas RA, Bernstein DI, Blessing-Moore J, Cox L, Khan D, Lang DM, Oppenheimer J, Portnoy JM, Randolph CR, Schuller DE, Spector SL, Tilles SA, Wallace D. Adverse reactions to vaccines practice parameter 2012 update. J Allergy Clin Immunol. 2012 Jul;130(1):25–43.	Advisory Committee on Immunization Practices

		allergy who uneventfully received 597 doses. The Center for Disease Control and Prevention's Advisory Committee on Immunization Practices recommends that egg-allergic persons receive inactivated influenza vaccine as a single dose without prior vaccine skin testing and be observed for 30 minutes afterwards for any possible allergic reaction. If the reaction to the ingestion of eggs was hives only, the vaccine can be administered in a primary care setting, whereas if the reaction to the ingestion of eggs was more severe, the vaccine should be administered in an allergist/immunologist's office. Two new inactivated influenza vaccine not grown in eggs have been approved for patients 18 years and older: Flucelvax, prepared from virus propagated in cell culture, and Flublok, recombinant hemagglutinin proteins produced in an insect cell line. For egg-allergic patients 18 years of age and older, either egg-based inactivated influenza vaccine can be used with the precautions above or egg-free inactivated influenza vaccine can be used. Measles and mumps vaccines (and Purified Chick Embryo Cell rabies vaccine) are grown in chick embryo fibroblast cultures and contain negligible or no egg protein. Thus, measles, mumps, and rubella and Purified Chick Embryo Cell rabies vaccine can be administered to egg-allergic recipients in the usual manner. Per the Yellow Fever vaccine package insert, egg-allergic recipients should be skin tested with the vaccine prior to administration. If negative, the vaccine can be given in the usual manner, but the patient should be observed for 30 minutes afterward. If the vaccine skin test is positive, the vaccine can be given in graded doses under appropriate medical observation.	YF-VAX (Sanofi Pasteur) Package Insert. 2010.	

Preventive Medicine **Cardio-vascular**	Avoid use of ultrasound for routine surveillance of carotid arteries in the asymptomatic healthy population at any time. *Society for Vascular Surgery*	The presence of a bruit alone does not warrant serial duplex ultrasounds in low-risk, asymptomatic patients, unless significant stenosis is found on the initial duplex ultrasound. The presence of asymptomatic severe carotid artery disease in the general population yields a risk of neurologic event, which is <2%. Even in patients who have a bruit, if no other risk factors exist, the incidence is only 2%. Age (over 65), coronary artery disease, need for coronary bypass, symptomatic lower extremity arterial occlusive disease, history of tobacco use, and high cholesterol would be appropriate risk factors to prompt ultrasound in patients with a bruit. Otherwise, these ultrasounds may prompt unnecessary and more expensive and invasive tests, or even unnecessary surgery. In general population-based studies, the prevalence of severe carotid stenosis is not high enough to make bruit alone an indication for carotid screening. With these facts in mind, screening should be pursued only if a bruit is associated with other risk factors for stenosis and stroke, or if the primary care physician determines a patient is at increased risk for carotid artery occlusive disease.	Ricotta JJ, Aburahma A, Ascher E, Eskandari M, Faries P, Lal BK; Society for Vascular Surgery. Updated Society for Vascular Surgery guidelines for management of extracranial carotid disease. J Vasc Surg. 2011;54(3):e1-31. Jacobowitz GR, Rockman CB, Gagne PJ, Adelman MA, Lamparello PJ, Landis R, Riles TS. A model for predicting occult carotid artery stenosis: screening is justified in a selected population. J Vasc Surg. 2003;38(4):705-9. Qureshi AI, Janardhan V, Bennett SE, Luft AR, Hopkins LN, Guterman LR. Who should be screened for asymptomatic carotid artery stenosis? Experience from the Western New York stroke screening program. J Neuroimaging. 2001;11(2):105-11.	Society for Vascular Surgery guidelines
Preventive medicine **Cardio-vascular** **Oncologic**	Don't take a multi-vitamin, vitamin E, or beta-carotene to prevent cardiovascular disease or cancer. *American College of Preventive Medicine*	Vitamin supplementation is a multi-billion dollar industry ($28.1 billion in 2010) in the United States, much of which is taken with the intention to prevent cardiovascular disease or cancer. However, there is insufficient evidence to demonstrate benefit from multivitamin supplementation to prevent cardiovascular disease or cancer. Adequate evidence demonstrates that supplementation with vitamin E and bet- carotene in healthy populations specifically has no benefit on cardiovascular disease or cancer. Beta-carotene is also associated with increased risks of lung cancer in smokers and people who	Nutrition Business Journal. NBJ's supplement business report: an analysis of markets, trends, competition and strategy in the U.S. dietary supplement industry. New York, NY: 2011. Moyer; U.S Preventive Services Task Force. Vitamin, mineral, and multivitamin supplements for the primary prevention of cardiovascular disease and cancer: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2014;160(8):558-64.	U.S. Preventive Services Task Force

		have been exposed to asbestos.		
Preventive medicine **Oncologic** **Urologic**	Don't routinely perform PSA-based screening for prostate cancer. *American College of Preventive Medicine*	More than 1,000 symptom-free men need to be screened for prostate cancer to save one additional life. As a result, increased harms and medical costs due to widespread screening of asymptomatic men are believed to outweigh the benefits of routine screening. There is a high likelihood of having a false-positive result, leading to worry, decreased quality of life, and unnecessary biopsies when many of these elevated PSAs are caused by enlarged prostates and infection instead of cancer. This recommendation pertains to the routine screening of most men. In rare circumstances, such as a strong family history of prostate and related cancers, screening may be appropriate.	Lim LS, Sherin K; ACPM Prevention Practice Committee. Screening for prostate cancer in U.S. men ACPM position statement on preventive practice. Am J Prev Med. 2008;34(2):164-70. Moyer; U.S Preventive Services Task Force. Screening for prostate cancer: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2012;157(2):120-34. Qaseem A, Barry MJ, Denberg TD, Owens DK, Shekelle P; Clinical Guidelines Committee of the American College of Physicians. Screening for prostate cancer: a guidance statement from the Clinical Guidelines Committee of the American College of Physicians. Ann Intern Med. 2013;158(10):761-9.	U.S. Preventive Services Task Force, American College of Preventive Medicine, ACP guidelines
Preventive medicine **Oncologic**	Don't use whole-body scans for early tumor detection in asymptomatic patients. *American College of Preventive Medicine*	Whole-body scanning with a variety of techniques (magnetic resonance imaging, single-photon emission computed tomography, positron emission tomography, CT) is marketed by some to screen for a wide range of undiagnosed cancers. However, there are no data suggesting that these imaging studies will improve survival or improve the likelihood of finding a tumor (estimated tumor detection is less than 2% in asymptomatic patients screened). Whole-body scanning has a risk of false-positive findings that can result in unnecessary testing and procedures with additional risks, including considerable exposure to radiation with positron emission tomography and CT, a very small increase in the possibility of developing cancer later in life, and accruing additional medical costs as a result of these procedures. Whole-body scanning is not recommended by medical professional societies for individuals without symptoms, nor is it a routinely practiced screening procedure in healthy populations.	Ladd SC. Whole-body MRI as a screening tool? Eur J Radiol. 2009;70(3):452-62. Schmidt G, Dinter D, Reiser MF, Schoenberg SO. The uses and limitations of whole-body magnetic resonance imaging. Dtsch Arztebl Int. 2010;107(22):383-9. Full-Body CT Scans – What You Need to Know, Radiation-Emitting Products. U.S. Department of Health and Human Services [Internet]. Silver Spring, MD: U.S. Food and Drug Administration; 2010 [updated 2010 Apr 6; cited 2014 Dec 5]. Available from: http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/MedicalImaging/MedicalX-Rays/ucm115340.htm.	Expert consensus

Preventive medicine	Don't use expensive medications when an equally effective and lower-cost medication is available. *American College of Preventive Medicine*	On average, the cost of a generic drug is 80–85% lower than the brand-name product, although generic drugs are required to have the same active ingredients and strength, and similar effectiveness as brand-name drugs. Studies estimate that for every 10% increase in the use of generic cholesterol drugs, Medicare costs could be reduced by $1 billion annually.	Hoadley JF, Merrell K, Hargrave E, Summer L. In Medicare Part D plans, low or zero copays and other features to encourage the use of generic statins work, could save billions. Health Affairs (Millwood). 2012;31(10):2266-75. Mohler, PJ. New drugs: how to decide which ones to prescribe. Fam Pract Manag. 2006;13(6):33-5 Shrank WH, Hoang T, Ettner SL, Glassman PA, Nair K, DeLapp D, Dirstine J, Avorn J, Asch SM. The implications of choice: prescribing generic or preferred pharmaceuticals improves medication adherence for chronic conditions. Arch Intern Med. 2006;166(3):332-7. Facts about generic drugs [Internet]. Silver Spring, MD: U.S. Food and Drug Administration; 2012 [updated 2012 Sep 19; cited 2014 Dec 5].Available from: http://www.fda.gov/Drugs/ResourcesForYou/Consumers/BuyingUsingMedicineSafely/UnderstandingGenericDrugs/ucm167991.htm.	Expert consensus
Preventive medicine **Oncologic** **Gynecologic**	Don't perform screening for cervical cancer in low-risk women aged 65 years or older and in women who have had a total hysterectomy for benign disease. *American College of Preventive Medicine*	Health care professionals should not perform cervical cancer screening in women who have had a hysterectomy that removed their cervix and do not have a history of high-grade precancerous lesions or cervical cancer. Screening provides no benefits to these patients and may subject them to potential risks from false-positive results, including physical (e.g., vaginal bleeding from biopsies) or psychological (e.g., anxiety). In addition, cervical cancer screening should not be performed in women over the age of 65 that are at low risk for cervical cancer and have had negative results from prior screenings. Health care professionals should make this decision on a case-by-case basis, but once a patient stops receiving screenings, in general, they should not restart screenings. Screening for women in this population provides little to no benefit because the incidence and prevalence of cervical disease declines for women starting at age 40–50 years.	Moyer; U.S. Preventive Services Task Force. Screening for cervical cancer: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2012;156(12):880-91, W312. Saslow D, Solomon D, Lawson HW, Killackey M, Kulasingam SL, Cain J, Garcia FA, Moriarty AT, Waxman AG, Wilbur DC, Wentzensen N, Downs LS Jr, Spitzer M, Moscicki AB, Franco EL, Stoler MH, Schiffman M, Castle PE, Myers ER; ACS-ASCCP-ASCP Cervical Cancer Guideline Committee. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. CA Cancer J Clin. 2012;62(3):147-72.	U.S. Preventive Services Task Force

Preventive medicine **Oncology** **Geriatrics**	Don't recommend screening for breast, colorectal or prostate cancer if life expectancy is estimated to be less than 10 years. *The Society for Post-Acute and Long-Term Care Medicine*	Many patients residing in the long-term care setting are elderly and frail, with multimorbidity and limited life expectancy. Although research evaluating the impact of screening for breast, colorectal, and prostate cancer in older adults in general and long-term care residents in particular is scant, available studies suggest that multimorbidity and advancing age significantly alter the risk-benefit ratio. Preventive cancer screenings have both immediate and longer term risks (e.g., procedural and psychological risks, false positives, identification of cancer that may be clinically insignificant, treatment-related morbidity and mortality). Benefits of cancer screening occur only after a lag time of 10 years (colorectal or breast cancer) or more (prostate cancer). Patients with a life expectancy shorter than this lag time are less likely to benefit from screening. Discussing the lag time ("When will it help?") with patients is at least as important as discussing the magnitude of any benefit ("How much will it help?"). Prostate cancer screening by PSA testing is not recommended for asymptomatic patients because of a lack of life-expectancy benefit. One-time screening for colorectal cancer in older adults who have never been screened may be cost-effective; however, it should not be considered after age 85 and for most long-term care patients older than 75 the burdens of screening likely outweigh any benefits.	Clarfield AM. Screening in frail older people: an ounce of prevention or a pound of trouble? J Am Geriatr Soc. 2010 Oct;58:2016-21. Gill TM. The central role of prognosis in clinical decision making. JAMA. 2012 Jan 11;307(2):199-200. Gross CP. Cancer screening in older persons: a new age of wonder. JAMA Intern Med. 2014 Oct;174(10):1565-7. Lee SJ, Leipzig RM, Walter LC. Incorporating lag time to benefit into prevention decision for older adults. JAMA. 2013 Dec (25);310(24):2609-10. Lonsdorp-Vogelaar I, Gulati R, Mariotto AB, Schechter CB, de Carvalho TM, Knudsen AB, van Ravesteyn NT, Heijnsdijk EA, Pabiniak C, van Ballegooijen M, Rutter CM, Kuntz KM, Feuer EJ, Etzioni R, de Koning HJ, Zauber AG, Mandelblatt JS. Personalizing age of cancer screening cessation based on comorbid conditions: model estimates of harms and benefits. Ann Intern Med. 2014 Jul 15;161(2):104-12. Moyer VA. Screening for prostate cancer: U.S. Preventive Services Task Force Recommendation Statement. Ann Intern Med. 2012 Jul 17;157(2):120-34. Royce TJ, Hendrix LH, Stokes WA, Allen IM, Chen RC. Cancer screening rates in individuals with different life expectancies. JAMA Intern Med. 2014 Oct;174(10):1558-65. Spivack B, Cefalu C, Kamel H, et al. Health Maintenance in the Long Term Care Setting Clinical Practice Guideline. 2012. Columbia, MD: American Medical Directors Association. van Hees F, Habbema JD, Meester RG, Lansdorp-Vogelaar I, van Ballegooijen M, Zauber AG. Should colorectal cancer screening be considered in elderly persons without previous screening? A cost-effectiveness analysis. Ann Intern Med. 2014 Jun 3;160(11):750-9. Walter LC, Covinsky KE. Cancer screening in elderly patients: a framework for individualized decision making. JAMA. 2001 Jun 6;285(21):2750-6.	Expert consensus
Preventive medicine **Urologic** **Oncologic**	Offer PSA screening for detecting prostate cancer only after engaging in shared decision making. *American Urological Association*	Shared decision making (between health care provider and patient and, in some cases, family members) is an excellent strategy for making health care decisions when there is more than one medically reasonable option. Since both screening and not screening may be reasonable options, depending on the particular situation, shared decision making is	Early detection of prostate cancer: American Urological Association guideline, 2013 [Internet]. Linthicum (MD): American Urological Association; 2013 [cited 2014 Nov 4]. Available from: www.auanet.org/education/guidelines/prostate-cancer-detection.cfm.	Expert consensus

		recommended.		

Topic area(s)	Recommendation	Rationale and comments	References	Source
Psychiatric	Don't prescribe antipsychotic medications to patients for any indication without appropriate initial evaluation and appropriate ongoing monitoring. *American Psychiatric Association*	Metabolic, neuromuscular, and cardiovascular side effects are common in patients receiving antipsychotic medications for any indication, so thorough initial evaluation to ensure that their use is clinically warranted, and ongoing monitoring to ensure that side effects are identified, are essential. "Appropriate initial evaluation" includes the following: (a) thorough assessment of possible underlying causes of target symptoms including general medical, psychiatric, environmental or psychosocial problems; (b) consideration of general medical conditions; and (c) assessment of family history of general medical conditions, especially of metabolic and cardiovascular disorders. "Appropriate ongoing monitoring" includes re-evaluation and documentation of dose, efficacy and adverse effects; and targeted assessment, including assessment of movement disorder or neurological symptoms; weight, waist circumference and/or body mass index; blood pressure; heart rate; blood glucose level; and lipid profile at periodic intervals.	American Psychiatric Association. Practice guideline for the psychiatric evaluation of adults, second edition. Am J Psychiatry. 2006 Jun;163(Suppl):3-36. Available from: http://psychiatryonline.org/content.aspx?bookid=28&sectionid=2021669. American Diabetes Association; American Psychiatric Association; American Association of Clinical Endocrinologists; North American Association for the Study of Obesity. Consensus development conference on antipsychotic drugs and obesity and diabetes. Diabetes Care. 2004;27(2):596-601. Dixon L, Perkins D, Calmes C. Guideline watch (September 2009): practice guideline for the treatment of patients with schizophrenia [Internet]. Psychiatry Online. [cited 2013 Mar 8] Available from: http://psychiatryonline.org/content.aspx?bookid=28&sectionid=1682213. Maglione M, Ruelaz Maher A, Hu J, Wang Z, Shanman R, Shekelle PG, Roth B, Hilton L, Suttorp MJ, Ewing BA, Motala A, Perry T; Southern California Evidence-Based Practice Center. Off-label use of atypical antipsychotics: an update. Rockville, Md.: Agency for Healthcare Research and Quality; 2011 Sep 437 p. Report No.: HHSA290-2007-10062-1. Nasrallah HA. Atypical antipsychotic-induced metabolic side effects: insights from receptor-binding profiles. Mol Psychiatry. 2008 Jan;13(1):27-35.	American Psychiatric Association guideline
Psychiatric	Don't routinely prescribe two or more antipsychotic medications concurrently. *American Psychiatric Association*	Research shows that use of two or more antipsychotic medications occurs in 4% to 35% of outpatients and 30% to 50% of inpatients. However, evidence for the efficacy and safety of using multiple antipsychotic medications is limited, and risk for drug interactions, noncompliance, and medication errors is increased. Generally, the use of two or more antipsychotic medications concurrently should be avoided except in cases of three failed trials of monotherapy, which included one failed trial of clozapine where possible, or where a second	American Psychiatric Association. Practice guideline for the treatment of patients with schizophrenia, second edition. Am J Psychiatry. 2004 Feb;161(2 Suppl):1-56. Available from: http://psychiatryonline.org/content.aspx?bookid=28&sectionid=1682213. Kane J, Honigfeld G, Singer J, Meltzer H. Clozapine for the treatment-resistant schizophrenic. A double-blind comparison with chlorpromazine. Arch Gen Psychiatry. 1988;45(9):789-96. McEvoy JP, Lieberman JA, Stroup TS, Davis SM, Meltzer HY, Rosenheck RA, Swartz MS, Perkins DO, Keefe RS, Davis CE, Severe J, Hsiao JK, CATIE Investigators. Effectiveness of clozapine versus olanzapine, quetiapine, and risperidone in patients with chronic	American Psychiatric Association guideline

		antipsychotic medication is added with a plan to cross-taper to monotherapy.	schizophrenia who did not respond to prior atypical antipsychotic treatment. Am J Psychiatry. 2006;163(4):600-10. Maglione M, Ruelaz Maher A, Hu J, Wang Z, Shanman R, Shekelle PG, Roth B, Hilton L, Suttorp MJ, Ewing BA, Motala A, Perry T; Southern California Evidence-Based Practice Center. Off-label use of atypical antipsychotics: an update. Rockville, Md.: Agency for Healthcare Research and Quality; 2011 Sep 437 p. Report No.: HHSA290-2007-10062-1. Specifications Manual for Joint Commission National Quality Measures (v2013A1). Measure Set: Hospital Based Inpatient Psychiatric Services (HBIPS), Set Measure ID: HBIPS-4. Stahl SM, Grady MM. A critical review of atypical antipsychotic utilization: comparing monotherapy with polypharmacy and augmentation. Curr Med Chem. 2004;11(3):313-27.	
Psychiatric	Don't routinely prescribe antipsychotic medications as a first-line intervention for insomnia in adults. *American Psychiatric Association*	There is inadequate evidence for the efficacy of antipsychotic medications to treat insomnia (primary or due to another psychiatric or medical condition), with the few studies that do exist showing mixed results.	American Diabetes Association; American Psychiatric Association; American Association of Clinical Endocrinologists; North American Association for the Study of Obesity. Consensus development conference on antipsychotic drugs and obesity and diabetes. Diabetes Care. 2004;27(2):596-601. Maglione M, Ruelaz Maher A, Hu J, Wang Z, Shanman R, Shekelle PG, Roth B, Hilton L, Suttorp MJ, Ewing BA, Motala A, Perry T; Southern California Evidence-Based Practice Center. Off-label use of atypical antipsychotics: an update. Rockville, Md.: Agency for Healthcare Research and Quality; 2011 Sep 437 p. Report No.: HHSA290-2007-10062-1. Nasrallah HA. Atypical antipsychotic-induced metabolic side effects: insights from receptor-binding profiles. Mol Psychiatry. 2008 Jan;13(1):27-35.	AHRQ
Psychiatric	Avoid use of hypnotics as primary therapy for chronic insomnia in adults; instead offer cognitive behavioral therapy, and reserve medication for adjunctive treatment when necessary. *American Academy of Sleep Medicine*	Cognitive behavioral therapy for chronic insomnia involves a combination of behavioral modification, such as stimulus control and sleep restriction, and cognitive strategies, such as replacement of unrealistic fears about sleep with more positive expectations. In clinical trials, cognitive behavioral therapy is generally as effective as or more effective than hypnotics at improving sleep, and can be effective over an extended period of time without side effects associated with hypnotics. Some patients may benefit	Edinger JD, Wohlgemuth WK, Radtke RA, Marsh GR, Quillian RE. Cognitive behavioral therapy for treatment of chronic primary insomnia: a randomized controlled trial. JAMA. 2001;285(14):1856-64. Sivertsen B, Omvik S, Pallesen S, et al. Cognitive behavioral therapy vs zopiclone for treatment of chronic primary insomnia in older adults: a randomized controlled trial. JAMA. 2006;295(14):2851-8. Morin CM, Vallières A, Guay B, et al. Cognitive behavioral therapy, singly and combined with medication, for persistent insomnia: a randomized controlled trial. JAMA. 2009;301(19):2005-15.	Randomized controlled trials

		from a limited course of hypnotics while cognitive behavioral therapy for chronic insomnia is initiated. Patients who have successfully used hypnotics for extended periods and are reluctant to discontinue their current treatment regimen may be reasonable candidates for continued pharmacologic treatment.		
Psychiatric **Geriatric**	Don't administer "prn" (i.e., as needed) sedative, antipsychotic, or hypnotic medications to prevent and/or treat delirium without first assessing for, removing, and treating the underlying causes of delirium and using nonpharmacologic delirium prevention and treatment approaches. *American Academy of Nursing)*	The most important step in treating delirium is identifying, removing, and treating the underlying cause(s) of delirium. Delirium is often a direct physiological consequence of another medical condition, substance intoxication or withdrawal, or exposure to a toxin, or is due to multiple etiologies. Clinicians should therefore perform a detailed history and physical exam, order appropriate laboratory/diagnostic tests, conduct a thorough medication review, and discontinue any potentially deliriogenic medications. Because numerous medications or medication classes are associated with the development of delirium (e.g., benzodiazepines, anticholinergics, diphenhydramine, sedative-hypnotics), their administration on a prn basis should be avoided if possible. Moreover, due to the potential for harm and lack of sufficient evidence supporting the safety and efficacy of antipsychotics for the prevention and treatment of delirium, these medications should be administered only at the lowest effective dose, for the shortest amount of time, in patients who are severely agitated and/or at risk for harming themselves and/or others. In terms of delirium prevention, it is recommended health systems should implement multicomponent, nonpharmacologic interventions that are delivered consistently throughout hospitalization by the interdisciplinary team.	American Geriatrics Society abstracted clinical practice guideline for postoperative delirium in older adults. J Am Geriatr Soc. 2015 Jan;63(1):142-50. Diagnostic and statistical manual of mental disorders. (5th ed.). Washington (DC): American Psychiatric Association. 2013. Barr J, Fraser GL, Puntillo K, Ely EW, Gélinas C, Dasta JF, Davidson JE, Devlin JW, Kress JP, Joffe AM, Coursin DB, Herr DL, Tung A, Robinson BR, Fontaine DK, Ramsay MA, Riker RR, Sessler CN, Pun B, Skrobik Y, Jaeschke R; American College of Critical Care Medicine. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. Crit Care Med. 2013 Jan;41(1):263-306. Campbell N, Boustani MA, Ayub A, Fox GC, Munger SL, Ott C, Guzman O, Farber M, Ademuyiwa A, Singh R. Pharmacological management of delirium in hospitalized adults—a systematic evidence review. J Gen Intern Med. 2009 Jul;24(7):848-53. By the American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. J Am Geriatr Soc. 2015 Nov;63(11):2227-46. Hawkins SB, Bucklin M, Muzyk AJ. Quetiapine for the treatment of delirium. J Hosp Med. 2013 Apr;8(4):215-20. Inouye SK, Marcantonio ER, Metzger ED. Doing damage in delirium: the hazards of antipsychotic treatment in elderly persons. Lancet Psychiatry. 2014 Sep 1;1(4):312-5.	American Geriatrics Society guidelines

Psychiatric **Geriatric**	Don't assume a diagnosis of dementia in an older adult who presents with an altered mental status and/or symptoms of confusion without assessing for delirium or delirium superimposed on dementia using a brief, sensitive, validated assessment tool. *American Academy of Nursing*	Delirium is common in older adults, especially in the hospital setting, yet delirium is frequently unrecognized and not documented by nursing or medical staff. Delirium occurs in as much as 50% of older adults in the hospital, and delirium superimposed on dementia occurs in as high as 90% of hospitalized older adults. Delirium is associated with very poor clinical outcomes, including prolonged length of stay, high costs and lower quality of life for older adults when not detected early. Delirium is treatable and often reversible and dementia is not, so mislabeling older adults with dementia may miss a life-threatening underlying condition causing the delirium such as an infection, medication side effect, or subdural hematoma. Delirium is extremely costly to the health care system and to society with estimates ranging from $143 to $152 billion annually. Nurses and physicians often fail to recognize delirium. Only 12% to 35% of delirium cases are detected in routine care, with hypoactive delirium and delirium superimposed on dementia most likely to be missed.	Voyer P, Champoux N, Desrosiers J, Landreville P, McCusker J, Monette J, Savoie M, Richard S, Carmichael PH. Recognizing acute delirium as part of your routine [RADAR]: a validation study. BMC Nurs. 2015 Apr 1;14:19. Inouye SK, Westendorp RG, Saczynski JS. Delirium in elderly people. Lancet. 2014 Mar 8;383(9920):911-22. Fick DM, Steis MR, Waller JL, Inouye SK. Delirium superimposed on dementia is associated with prolonged length of stay and poor outcomes in hospitalized older adults. J Hosp Med. 2013 Sep;8(9):500-5. Steis MR, Fick DM. Delirium superimposed on dementia: accuracy of nurse documentation. J Gerontol Nurs. 2012 Jan;38(1):32-42. Kolanowski AM, Fick DM, Yevchak AM, Hill NL, Mulhall PM, McDowell JA. Pay attention! The critical importance of assessing attention in older adults with dementia. J Gerontol Nurs. 2012 Nov 15;38(11):23-7. Leslie DL, Inouye SK. The importance of delirium: economic and societal costs. J Am Geriatr Soc. 2011 Nov; 59 Suppl 2:S241-3. Williams KN, Herman RE. Linking resident behavior to dementia care communication: eff of emotional tone. Behav Ther. 2011 Mar;42(1):42-6. doi: 10.1016/j. beth.2010.03.003. Epub 2010 Oct 1. Fick DM, Hodo DM, Lawrence F, Inouye SK. Recognizing delirium superimposed on dementia: assessing nurses' knowledge using case vignettes. J Gerontol Nurs. 2007 Feb;33(2):40-7.	Expert consensus
Psychiatric **Pediatric**	Don't routinely prescribe antipsychotic medications as a first-line intervention for children and adolescents for any diagnosis other than psychotic disorders. *American Psychiatric Association*	Recent research indicates that use of antipsychotic medication in children has nearly tripled in the past 10 to 15 years, and this increase appears to be disproportionate among children with low family income, minority children, and children with externalizing behavior disorders (i.e., rather than schizophrenia, other psychotic disorders and severe tic disorders). Evidence for the efficacy and tolerability of antipsychotic medications in children and adolescents is inadequate and there are notable concerns about weight gain, metabolic side effects, and	Correll CU. Monitoring and management of antipsychotic-related metabolic and endocrine adverse events in pediatric patients. Int Rev Psychiatry. 2008;20(2):195-201. Findling RL, Drury SS, Jensen PS, Rapoport JL; AACAP Committee on Quality Issues. Practice parameter for the use of atypical antipsychotic medications in children and adolescents [Internet]. American Academy of Child and Adolescent Psychiatry. [cited 2013 Mar 3]. Available from: http://www.aacap.org/galleries/PracticeParameters/Atypical_Antipsychotic_ Medications_Web.pdf. Loy JH, Merry SN, Hetrick SE, Stasiak K. Atypical antipsychotics for disruptive behaviour disorders in children and youths. Cochrane	American Academy of Child and Adolescent Psychiatry guideline, Cochrane Database of Systematic Reviews

		a potentially greater tendency for cardiovascular changes in children than in adults.	Database Syst Rev. 2012 Sep 12;9:CD008559. Zito JM, Burcu M, Ibe A, Safer DJ, Magder LS. Antipsychotic use by Medicaid-insured youths: impact of eligibility and psychiatric diagnosis across a decade. Psychiatr Serv. 2013 Mar 1;64(3):223-9.	
Psychiatric **Geriatric**	Avoid physical restraints to manage behavioral symptoms of hospitalized older adults with delirium. *American Geriatrics Society*	Persons with delirium may display behaviors that risk injury or interference with treatment. There is little evidence to support the effectiveness of physical restraints in these situations. Physical restraints can lead to serious injury or death and may worsen agitation and delirium. Effective alternatives include strategies to prevent and treat delirium, identification and management of conditions causing patient discomfort, environmental modifications to promote orientation and effective sleep-wake cycles, frequent family contact and supportive interaction with staff. Nursing educational initiatives and innovative models of practice have been shown to be effective in implementing a restraint-free approach to patients with delirium. This approach includes continuous observation; trying re-orientation once, and if not effective, not continuing; observing behavior to obtain clues about patients' needs; discontinuing and/or hiding unnecessary medical monitoring devices or IVs; and avoiding short-term memory questions to limit patient agitation. Pharmacological interventions are occasionally utilized after evaluation by a medical provider at the bedside, if a patient presents harm to him or herself or others. Physical restraints should only be used as a very last resort and should be discontinued at the earliest possible time.	Bray K, Hill K, Robson W, Leaver G, Walker N, O'Leary M, Delaney T, Walsh D, Gager M, Waterhouse C; British Association of Critical Care Nurses. British Association of Critical Care Nurses position statement on the use of restraint in adult critical care units. Nurs Crit Care. 2004 Sep-Oct;9(5):199–212. Center for Medicare & Medicaid Services. Electronic Code of Federal Regulations. Condition of participation: patient's rights. 42 C.F.R. §482.13. Cotter VT, Evans LK. Avoiding restraints in hospitalized older adults with dementia. Best practices in nursing care to older adults with dementia. 2012;D1. Inouye SK. Delirium in older persons. N Engl J Med. 2006;354:1157–65. Minnick AF, Mion LC, Johnson ME, Catrambone C, Leipzig R. Prevalence and variation of physical restraint use in acute care settings in the U.S. J Nurs Scholarsh. 2007;39(1):30–7. Maccioli GA, Dorman T, Brown BR, Mazuski JE, McLean BA, Kuszaj JM, Rosenbaum SH, Frankel LR, Devlin JW, Govert JA, Smith B, Peruzzi WT; American College of Critical Care Medicine, Society of Critical Care Medicine. Clinical practice guidelines for the maintenance of patient physical safety in the intensive care unit: use of restraining therapies – American College of Critical Care Medicine Task Force 2001-2002. Crit Care Med. 2003;31(11): 2665–767. Mott S, Poole J, Kenrick M. Physical and chemical restraints in acute care: their potential impact on rehabilitation of older people. Int J Nurs Pract. 2005 Jun;11(3):95–101. Flaherty JH, Little MO. Matching the environment to patients with delirium: lessons learned from the delirium room, a restraint-free environment for older hospitalized adults with delirium. J Am Geriatr Soc. 2011 Nov;59Suppl 2:S295–300.	Expert consensus

Topic area(s)	Recommendation	Rationale and comments	References	Source
Pulmonary medicine **Pediatrics**	Don't order chest radiographs in children with uncomplicated asthma or bronchiolitis. *Society of Hospital Medicine (Pediatric)*	National guidelines articulate a reliance on physical examination and patient history for diagnosis of asthma and bronchiolitis in the pediatric population. Multiple studies have established limited clinical utility of chest radiographs for patients with asthma or bronchiolitis. Omission of the use of chest radiography will reduce costs, but not compromise diagnostic accuracy and care.	American Academy of Pediatrics. Diagnosis and management of bronchiolitis. Pediatrics. 2006;118(4):1774-93. National Heart, Lung and Blood Institute. Guidelines for the diagnosis and management of asthma. 2007. http://www.nhlbi.nih.gov/guidelines/asthma/. Dawson, KP, et al. The chest radiograph in acute bronchiolitis. J Paediatr Child. 1990;26(4):209-11. Roback MG, et al. Chest radiograph in the evaluation of first time wheezing episodes: review of current clinical efficacy. Pediatr Emerg Care. 1998;14(3):181-4.	AAP, National Heart, Lung and Blood Institute guidelines
Pulmonary medicine **Pediatrics**	Don't routinely use bronchodilators in children with bronchiolitis. *Society of Hospital Medicine (Pediatric)*	Published guidelines do not advocate the routine use of bronchodilators in patients with bronchiolitis. Comprehensive reviews of the literature have demonstrated that the use of bronchodilators in children admitted to the hospital with bronchiolitis has no effect or any important outcomes. There is limited demonstration of clear impact of bronchodilator therapy upon the course of disease. Additionally, providers should consider the potential impact of adverse events upon the patient.	American Academy of Pediatrics. Diagnosis and management of bronchiolitis. Pediatrics. 2006;118(4):1774-93. Gadomski AM, et al. Bronchodilators for bronchiolitis. Cochrane Database Syst Rev. 2010;(12):CD001266.	AAP guideline, Cochrane Database of Systematic Reviews
Pulmonary medicine **Pediatrics** **Infectious disease**	Don't use systemic corticosteroids in children younger than two years with an uncomplicated lower respiratory tract infection. *Society of Hospital Medicine (Pediatric)*	Published guidelines recommend that corticosteroid medications not be used routinely in the management of bronchiolitis. Furthermore, additional studies in patients with other viral lower respiratory tract infections have failed to demonstrate any benefits.	American Academy of Pediatrics. Diagnosis and management of bronchiolitis. Pediatrics. 2006;118(4):1774-93. Klassen TP, et al. Dexamethasone in salbutamol-treated inpatients with acute bronchiolitis: a randomized, controlled trial. J Pediatr. 199;130(2):191-6. Patel H, et al. Glucocorticoids for acute viral bronchiolitis in infants and young children. Cochrane Database Syst Rev. 2004;(3):CD004878. De Boeck K, et al. Respiratory syncytial virus bronchiolitis: a double-blind dexamethasone efficacy study. J Pediatr. 1997;131(6):919-21. Von Woensel JBM, et al. Viral lower respiratory tract infection in infants and young children, BMJ. 2003;327(7405):36-40. Panickar J, et al. Oral prednisolone for preschool children with acute virus-induced wheezing. N Engl J Med. 2009;360(4):329-38.	AAP guideline, Cochrane Database of Systematic Reviews
Pulmonary medicine	Don't use continuous pulse oximetry routinely	The utility of continuous pulse oximetry in pediatric patients with acute respiratory illness	American Academy of Pediatrics. Diagnosis and management of bronchiolitis. Pediatrics. 2006;118(4):1774-93.	AAP guideline

Pediatric	in children with acute respiratory illness unless they are on supplemental oxygen. *Society of Hospital Medicine (Pediatric)*	is not well established. Use of continuous pulse oximetry has been previously associated with increased admission rates and increase length of stay. The clinical benefit of pulse oximetry is not validated or well documented.	Schroeder AR, et al. Impact of pulse oximetry and oxygen therapy on length of stay in bronchiolitis hospitalizations. Arch Pediatr Adolesc Med. 2004;158(6):527-30. Hunt CE, et al. Longitudinal assessment of hemoglobin oxygen saturation in healthy infants during the first 6 months of life. J Pediatr. 1999;135(5):580-6. Alverson, et al. Multi-center randomized trial of pulse oximetry monitoring strategies for children hospitalized for bronchiolitis. Abstract presented at IDWeek 2012, Oct. 2012, San Diego, Calif.	
Pulmonary medicine	Don't diagnose or manage asthma without spirometry. *American Academy of Allergy, Asthma and Immunology*	Clinicians often rely solely upon symptoms when diagnosing and managing asthma, but these symptoms may be misleading and be from alternate causes. Therefore, spirometry is essential to confirm the diagnosis in those patients who can perform this procedure. Recent guidelines highlight spirometry's value in stratifying disease severity and monitoring control. History and physical exam alone may over- or underestimate asthma control. Beyond the increased costs of care, repercussions of misdiagnosing asthma include delaying a correct diagnosis and treatment.	National Asthma Education and Prevention Expert Panel Report 3: Guidelines for the diagnosis and management of asthma. NIH Publication no. 08-5846. October 2007. Li J, et al. Attaining asthma control. A practice parameter. J Allergy Clin Immunol. 2005;115:S3-11. Global strategy for asthma management and prevention: GINA executive summary. Eur Respir J. 2008;31:143-78. Fuhlbrigge A, et. al. FEV1 is associated with risk of asthma attacks in a pediatric population. J Allergy Clin Immunol. 2001;107:61-6. Magadle R. The risk of hospitalization and near-fatal and fatal asthma in relation to the perception of dyspnea. Chest. 2002;121:329-33.	National Asthma Education and Prevention Expert Panel report
Pulmonary medicine	In patients with a low pretest probability of venous thrombo-embolism, obtain a high-sensitive D-dimer measurement as the initial diagnostic test; don't obtain imaging studies as the initial diagnostic test. *American College of Physicians*	In patients with low pretest probability of venous thromboembolism as defined by the Wells prediction rules, a negative high-sensitivity D-dimer measurement effectively excludes venous thromboembolism and the need for further imaging studies.	American College of Emergency Physicians. Evaluation and management of adult emergency department patients with suspected pulmonary embolism. January 2011. http://www.acep.org/Content.aspx?id=80332. 2008 European Society of Cardiology. Acute pulmonary embolism (diagnosis and management of). 2008. http://www.escardio.org/guidelines-surveys/esc-guidelines/Pages/acute-pulmonary-embolism.aspx. Snow V, et al. Management of venous thromboembolism. Ann Intern Med. 2007;146:204-10. Scottish Intercollegiate Guidelines Network. Prevention and management of venous thromboembolism. http://www.sign.ac.uk/guidelines/fulltext/122/index.html.	AAFP, ACP, ACEP guidelines
Pulmonary medicine	Don't image for suspected PE without moderate or high pretest probability.	While DVT and PE are relatively common clinically, they are rare in the absence of elevated blood D-dimer levels and certain specific risk factors. Imaging, particularly CT	Torbicki A, et al. Guidelines on the diagnosis and management of acute pulmonary embolism. Eur Heart J. 2008;29(18):2276-315. Neff MJ. ACEP releases clinical policy on evaluation and management	ACEP, European Society of Cardiology

	American College of Radiology	pulmonary angiography, is a rapid, accurate, and widely available test, but has limited value in patients who are very unlikely, based on serum and clinical criteria, to have significant value. Imaging is helpful to confirm or exclude PE only for such patients, not for patients with low pretest probability of PE.	of pulmonary embolism. Am Fam Physician. 2003;68(4):759-60. Stein PD, et al. Diagnostic pathways in acute pulmonary embolism: recommendations of the PIOPED II Investigators. Radiology. 2007;242(1):15–21.	guidelines
Pulmonary medicine	Avoid using a CT angiogram to diagnose PE in young women with a normal chest radiograph; consider a radionuclide lung study ("V/Q study") instead. *Society of Nuclear Medicine and Molecular Imaging*	When the clinical question is whether or not pulmonary emboli are present, a V/Q study can provide the answer with lower overall radiation dose to the breast than can CT angiography, even when performed with a breast shield.	International Commission on Radiological Protection report 53 (http://www.icrp.org/publication.asp?id=ICRP%20Publication%2053) and 80 (http://www.icrp.org/publication.asp?id= ICRP%20Publication%2080). McCollough, et al. Strategies for reducing radiation dose in CT. Radiol Clin North Am. 2009;47:27-40. Hurwitz, et al. Radiation dose savings for adult pulmonary embolus 64-MDCT using bismuth breast shields, lower peak kilovoltage, and automatic tube current modulation. AJR Am J Roentgenol. 2009;192:244-53. Stein EG, et al. Success of a safe and simple algorithm to reduce use of CT pulmonary angiography in the emergency department. AJR Am J Roentgenol. 2010;194:392-7. Parker MS, et al. Female breast radiation exposure during CT pulmonary angiography. AJR Am J Roentgenol. 2005;185: 1228-33. Niemann T, et al. Imaging for suspected pulmonary embolism in pregnancy-what about the fetal dose? A comprehensive review of the literature. Insights Imaging. 2010;1:361-72. Freeman LM, et al. V/Q scintigraphy: alive, well and equal to the challenge of CT angiography. Eur J Nucl Med Mol Imaging. 2009;36:499-504. Brenner DJ, et al. Computed tomography—an increasing source of radiation exposure. N Engl J Med. 2007;357:2277-84. Freeman LM, et al. The current and continuing role of ventilation-perfusion scintigraphy in evaluating patients with suspected pulmonary embolism. Semin Nucl Med. 2008;38(6): 432-40. Burns SK, et al. Diagnostic imaging and risk stratification of patients with acute pulmonary embolism. Cardiol Rev. 2012;20(1):15-24.	Expert consensus
Pulmonary medicine	Don't perform CT surveillance for evaluation of	Clinical practice guidelines for pulmonary nodule evaluation (such as those issued by the Fleischner Society or the American College of	MacMahon H, Austin JH, Gamsu G, Herold CJ, Jett JR, Naidich DP, Patz EF Jr, Swensen SJ; Fleischner Society. Guidelines for management of small pulmonary nodules detected on CT scans: a	ACCP guideline

	indeterminate pulmonary nodules at more frequent intervals or for a longer period of time than recommended by established guidelines. *American College of Chest Physicians* *American Thoracic Society*	Chest Physicians) suggest that intensity of surveillance should be guided by the likelihood of malignancy. In patients with no prior history of cancer, solid nodules that have not grown over a two-year period have an extremely low risk of malignancy (although longer follow-up is suggested for ground-glass nodules). Similarly, intensive surveillance (e.g., repeating CT scans every three months for two years or more) has not been shown to improve outcomes such as lung cancer mortality. Meanwhile, extended or intensive surveillance exposes patients to increased radiation and prolonged uncertainty.	statement from the Fleischner Society. Radiology. 2005;237(2):395-400. Gould MK, Donington J, Lynch WR, Mazzone, Midthun DE, Naidich DP, Wiener RS. Evaluation of patients with pulmonary nodules: When is it lung cancer?: ACCP evidence-based clinical practice guidelines (3rd edition). Chest. 2013 May;143(5):e93. Smith-Bindman R, Lipson J, Marcus R, Kim KP, Mahesh M, Gould R, Berrington de González A, Miglioretti DL. Radiation dose associated with common computed tomography examinations and the associated lifetime attributable risk of cancer. Arch Intern Med. 2009;169(22):2078-86. Wiener RS, Gould MK, Woloshin S, Schwartz LM, Clark JA. What do you mean, a spot? A qualitative analysis of patients' reactions to discussions with their doctors about pulmonary nodules. Chest. 2012 Jul 17. doi: 10.1378/chest.12–1095. [Epub ahead of print].	
Pulmonary medicine	For patients recently discharged on supplemental home oxygen following hospitalization for an acute illness, don't renew the prescription without assessing the patient for ongoing hypoxemia. *American College of Chest Physicians* *American Thoracic Society*	Hypoxemia often resolves after recovery from an acute illness, and continued prescription of supplemental oxygen therapy incurs unnecessary cost and resource use. At the time that supplemental oxygen is initially prescribed, a plan should be established to re-assess the patient no later than 90 days after discharge. Medicare and evidence-based criteria should be followed to determine whether the patient meets criteria for supplemental oxygen.	Croxton T, Baily W, for the NHLBI working group on Long-Term Oxygen Treatment in COPD. Report of a National Heart, Lung, and Blood Institute and Centers for Medicare and Medicaid Services Workshop. Long-term oxygen treatment in chronic obstructive pulmonary disease: recommendations for future research. Am J Respir Crit Care Med. 2006;174:373-8. O'Driscoll B, Howard L, Davison A. BTS guideline for emergency oxygen use in adult patients. Thorax. 2008;63 Suppl 6:vi1-68. MacNee W. Prescription of oxygen: still problems after all these years. Am J Respir Crit Care Med. 2005;172:517-22.	Expert consensus
Pulmonary medicine	Don't perform chest CT (CT angiography) to evaluate for possible pulmonary embolism in patients with a low clinical probability and negative results of a highly sensitive D-dimer assay.	Clinical practice guidelines for pulmonary embolism indicate that the cost and potential harms of CT angiography (including radiation exposure and the possibility of detecting and treating clinically insignificant pulmonary emboli with anticoagulation) outweigh the benefits for patients with a low pretest probability of pulmonary embolism. In patients with a low clinical prediction score	Fesmire FM, Brown MD, Espinosa JA, Shih RD, Silvers SM, Wolf SJ, Decker WW. Critical issues in the evaluation and management of adult patients presenting to the emergency department with suspected pulmonary embolism. Ann Emerg Med. 2011;57(6):628-652, e675. Qaseem A, Snow V, Barry P, Hornbake ER, Rodnick JE, Tobolic T, Ireland B, Segal JB, Bass EB, Weiss KB, Green L, Owens DK; Joint American Academy of Family Physicians/American College of Physicians Panel on Deep Venous Thrombosis/Pulmonary Embolism. Current diagnosis of venous thromboembolism in primary care: a	AAFP/ACP guideline

	American College of Chest Physicians *American Thoracic Society*	(e.g., Wells or Geneva score) followed by a negative D-dimer measured with a high sensitivity test (e.g., enzyme-linked immunosorbent assay [ELISA]), pulmonary embolism is effectively excluded and no further imaging is indicated for pulmonary embolism evaluation.	clinical practice guideline from the American Academy of Family Physicians and the American College of Physicians. Ann Intern Med. 2007 Mar 20;146(6):454-8. Torbicki A, Perrier A, Konstantinides S, Agnelli G, Galiè N, Pruszczyk P, Bengel F, Brady AJ, Ferreira D, Janssens U, Klepetko W, Mayer E, Remy-Jardin M, Bassand JP; ESC Committee for Practice Guidelines (CPG). Guidelines on the diagnosis and management of acute pulmonary embolism: the Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC). Eur Heart J. 2008;29(18):2276-315. The Christopher Study Investigators. Effectiveness of managing suspected pulmonary embolism using an algorithm combining clinical probability, D-dimer testing, and computed tomography. JAMA. 2006;295:172-9. Roy P-M, Colombet I, Durieux P, Chatellier G, Sors H, Meyer G. Systematic review and meta-analysis of strategies for the diagnosis of suspected pulmonary embolism. BMJ. 2005;331:259. Anderson DR, Kahn SR, Rodger MA, Kovacs MJ, Morris T, Hirsch A, Lang E, Stiell I, Kovacs G, Dreyer J, Dennie C, Cartier Y, Barnes D, Burton E, Pleasance S, Skedgel C, O'Rouke K, Wells PS. Computed tomographic pulmonary angiography vs ventilation-perfusion lung scanning in patients with suspected pulmonary embolism: A randomized controlled trial. JAMA. 2007;298(23):2743-53. Wiener RS, Schwartz LM, Woloshin S. Time trends in pulmonary embolism in the United States: evidence of overdiagnosis. Arch Intern Med. 2011;171(9):831-7.	
Pulmonary Medicine **Neurologic**	Don't routinely order sleep studies (polysomnogram) to screen for/diagnose sleep disorders in workers suffering from chronic fatigue/insomnia. *American College of Occupational and Environmental Medicine*	Workers who suffer from fatigue, but do not have other sleep apnea symptoms (e.g., waking with a very sore or dry throat, loud snoring) or risk factors (obesity, neck diameter, fullness of soft tissues in the oropharynx), may not need a polysomnogram (sleep study). While a polysomnogram is an essential tool in diagnosing many sleep disorders, it is not usually necessary in assessing insomnia. If lack of sufficient sleep or the job schedule is affecting the patient's sleep patterns, then behavioral modification and attempts to modify the sleep schedule and improve sleep hygiene should be attempted	Lerman SE, Eskin E, Flower DJ, George EC, Gerson B, Hartenbaum N, Hursh SR, Moore-Ede M; American College of Occupational and Environmental Medicine Presidential Task Force on Fatigue Risk Management. Fatigue risk management in the workplace. J Occup Environ Med. 2012 Feb;54(2):231–58.	Expert consensus

		first.		
Pulmonary Medicine	Don't perform positive airway pressure retitration studies in asymptomatic, adherent patients with sleep apnea and stable weight. *American Academy of Sleep Medicine*	Retitration of positive airway pressure is not indicated for adult obstructive sleep apnea patients with stable weight whose symptoms are well-controlled by their current positive airway pressure treatment. Follow-up polysomnography or retitration is indicated for adult patients who are again symptomatic despite the continued, proper use of positive airway pressure, especially if they have gained substantial weight (e.g., 10% of original weight) since the last titration study. A new diagnostic polysomnography or retitration may be indicated for patients who have lost substantial weight, to determine whether positive airway pressure treatment is still necessary.	Kushida CA, Littner MR, Morgenthaler T, Alessi CA, Bailey D, Coleman J Jr, Friedman L, Hirshkowitz M, Kapen S, Kramer M, Lee-Chiong T, Loube DL, Owens J, Pancer JP, Wise M. Practice parameters for the indications for polysomnography and related procedures: An update for 2005. Sleep. 2005;28(4):499-521. Epstein LJ, Kristo D, Strollo PJ Jr, Friedman N, Malhotra A, Patil SP, Ramar K, Rogers R, Schwab RJ, Weaver EM, Weinstein MD; Adult Obstructive Sleep Apnea Task Force of the American Academy of Sleep Medicine. Clinical guideline for the evaluation, management and long-term care of obstructive sleep apnea in adults. J Clin Sleep Med. 2009;5(3):263-76.	American Academy of Sleep guidelines

Topic area(s)	Recommendation	Rationale and comments	References	Source
Rheumatologic	Don't test for Lyme disease as a cause of musculoskeletal symptoms without an exposure history and appropriate exam findings. *American College of Rheumatology*	The musculoskeletal manifestations of Lyme disease include brief attacks of arthralgia or intermittent or persistent episodes of arthritis in one or a few large joints at a time, especially the knee. Lyme testing in the absence of these features increases the likelihood of false-positive results and may lead to unnecessary follow-up and therapy. Diffuse arthralgias, myalgias, or fibromyalgia alone are not criteria for musculoskeletal Lyme disease.	Guidelines and statements made by the Centers for Disease Control and Centers for Disease Control and Prevention. Lyme disease diagnosis and treatment. http://www.cdc.gov/lyme/diagnosistreatment/index.html. American College of Physicians. Guidelines for laboratory evaluation in the diagnosis of Lyme disease. Ann Intern Med. 1997;127(12):1106-8. Hu LT. Lyme disease. Ann Intern Med. 2012;157(3):ITC2-1. Wormser GP, et al. The clinical assessment, treatment, and prevention of Lyme disease, human granulocytic anaplasmosis, and babesiosis. Clin Infect Dis. 2006;43(9):1089-134.	Centers for Disease Control and Prevention, IDSA guidelines
Rheumatologic	Don't test ANA subserologies without a positive ANA and clinical suspicion of immune-mediated disease. *American College of Rheumatology*	Tests for ANA subserologies (including antibodies to double-stranded DNA, Smith, RNP, SSA, SSB, Scl-70, centromere) are usually negative if the ANA is negative. Exceptions include anti-Jo1, which can be positive in some forms of myositis, or occasionally, anti-SSA, in the setting of lupus or Sjögren syndrome. Broad testing of autoantibodies should be avoided; instead, the choice of autoantibodies should be guided by	Kavanaugh A, et al. Guidelines for clinical use of the antinuclear antibody test and tests for specific autoantibodies to nuclear antigens. Arch Pathol Lab Med. 2000;124(1):71-81. Solomon DH, et al. Evidence-based guidelines for the use of immunologic tests: antinuclear antibody testing. Arthritis Rheum. 2002;47(4):434-44. Tozzoli R, et al. Guidelines for the laboratory use of autoantibody tests in the diagnosis and monitoring of autoimmune rheumatic diseases. Am J Clin Pathol. 2002;117(2):316-24.	American College of Rheumatology guidelines

		the specific disease under consideration.		
Rheumatologic	Don't prescribe biologics for rheumatoid arthritis before a trial of methotrexate (or other conventional nonbiologic DMARDs). *American College of Rheumatology*	High-quality evidence suggests that methotrexate and other conventional nonbiologic DMARDs are effective in many patients with rheumatoid arthritis. Initial therapy for rheumatoid arthritis should be a conventional nonbiologic DMARD unless these are contraindicated. If a patient has had an inadequate response to methotrexate with or without other nonbiologic DMARDs during an initial three-month trial, then biologic therapy can be considered. Exceptions include patients with high disease activity AND poor prognostic features (functional limitations, disease outside the joints, seropositivity, or bony damage), where biologic therapy may be appropriate first-line treatment.	Singh JA, et al. 2012 update of the 2008 American College of Rheumatology recommendations for the use of disease-modifying antirheumatic drugs and biologic agents in the treatment of rheumatoid arthritis. Arthritis Care Res (Hoboken). 2012;64(5):625-39. Smolen JS, et al. EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs. Ann Rheum Dis. 2012;69(6):964-75.	American College of Rheumatology guidelines
Rheumatologic	Don't order autoantibody panels unless positive ANA and evidence of rheumatic disease. *American College of Rheumatology—Pediatric Rheumatology*	Up to 50% of children develop musculoskeletal pain. There is no evidence that autoantibody panel testing in the absence of history or physical exam evidence of a rheumatologic disease enhances the diagnosis of children with isolated musculoskeletal pain. Autoantibody panels are expensive; evidence has demonstrated cost reduction by limiting autoantibody panel testing. Thus, autoantibody panels should be ordered following confirmed ANA positivity or clinical suspicion that a rheumatologic disease is present in the child.	Wong KO, Bond K, Homik J, Ellsworth JE, Karkhaneh M, Ha C, Dryden DM. Antinuclear antibody, rheumatoid factor, and cyclic-citrullinated peptide tests for evaluating musculoskeletal complaints in children. Comparative Effectiveness Review No. 50. AHRQ Publication No. 12-EHC015-EF. Rockville, Md.: Agency for Healthcare Research and Quality. March 2012. Cabral DA, Petty RE, Fung M, Malleson PN. Persistent antinuclear antibodies in children without identifiable inflammatory rheumatic or autoimmune disease. Pediatrics. 1992;89:441-4. Deane PM, Liard G, Siegel DM, Baum J. The outcome of children referred to a pediatric rheumatology clinic with a positive antinuclear antibody test but without an autoimmune disease. Pediatrics. 1995;95:892-5. McGhee JL, Burks FN, Sheckels JL, Jarvis JN. Identifying children with chronic arthritis based on chief complaints: absence of predictive value for musculoskeletal pain as an indicator of rheumatic disease in children. Pediatrics. 2002;110:354-9. Man A, Shojania K, Phoon C, Pal J, Hudoba de Badyn M, Pi D, Lacaille D. An evaluation of autoimmune antibody testing patterns in a Canadian health region and an evaluation of a laboratory algorithm aimed at reducing unnecessary testing. Clin Rheumatol. 2012; doi:10.1007/s10067-012-2141-y.	AHRQ

Rheumatologic **Infectious disease**	Don't test for Lyme disease as a cause of musculoskeletal symptoms without an exposure history and appropriate exam findings. *American College of Rheumatology—Pediatric Rheumatology*	The musculoskeletal manifestations of Lyme disease include brief attacks of arthralgia or intermittent or persistent episodes of arthritis in one or a few large joints at a time, especially the knee. Lyme testing in the absence of these features increases the likelihood of false-positive results and may lead to unnecessary follow-up and therapy. Diffuse arthralgias, myalgias or fibromyalgia alone are not criteria for musculoskeletal Lyme disease.	Lyme Disease Diagnosis and Treatment. [Internet]. Atlanta (GA). Centers for Disease Control and Prevention. [Updated 2011 Nov 15; cited 2012 Sep 6]. Available from: www.cdc.gov/lyme/diagnosistreatment/index.html. American College of Physicians. Guidelines for laboratory evaluation in the diagnosis of Lyme disease. Ann Intern Med. 1997;127(12):1106-8. Hu LT. Lyme disease. Ann Intern Med. 2012;157(3):ITC2-1. Wormser GP, Dattwyler RJ, Shapiro ED, Halperin JJ, Steere AC, Klempner MS, Krause PJ, Bakken JS, Strle F, Stanek G, Bockenstedt L, Fish D, Dumler JS, Nadelman RB. The clinical assessment, treatment, and prevention of Lyme disease, human granulocytic anaplasmosis, and babesiosis: clinical practice guidelines by the Infectious Diseases Society of America. Clin Infect Dis. 2006;43(9):1089-134.	Centers for Disease Control and Prevention and IDSA guidelines

Discipline(s)	Recommendation	Rationale and comments	References	Source
Sports Medicine **Emergency Medicine** **Neurologic**	Avoid ordering a brain CT or brain MRI to evaluate an acute concussion unless there are progressive neurological symptoms, focal neurological findings on exam, or there is concern for a skull fracture. *American Medical Society for Sports Medicine*	Concussion is a clinical diagnosis. Concussion is not associated with clinically relevant abnormalities on standard neuroimaging with CT or MRI. These studies should be ordered if more severe brain injury is suspected. CT is best utilized for skull fracture and intracranial bleeding, whereas MRI may be ordered for prolonged symptoms, worsening symptoms, or other suspected structural pathology.	Harmon KG, Drezner JA, Gammons M, Guskiewicz KM, Halstead M, Herring SA, Kutcher JS, Pana A, Putukian M, Roberts WO. American Medical Society for Sports Medicine position statement: concussion in sport. Br J Sports Med. 2013 Jan;47(1):15–26. McCrory P, Meeuwisse WH, Aubry M, Cantu B, Dvořák J, Echemendia RJ, Engebretsen L, Johnston K, Kutcher JS, Raftery M, Sills A, Benson BW, Davis GA, Ellenbogen RG, Guskiewicz K, Herring SA, Iverson GL, Jordan BD, Kissick J, McCrea M, McIntosh AS, Maddocks D, Makdissi M, Purcell L, Putukian M, Schneider K, Tator CH, Turner M. Consensus statement on concussion in sport: the 4th International Conference on Concussion in Sport, Zurich, November 2012. Br J Sports Med. 2013 Apr;47(5):250–8. McCrory P, Meeuwisse W, Johnston K, Dvorak J, Aubry M, Molloy M, Cantu R. Consensus statement on concussion in sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. Phys Sportsmed. 2009 Jun;37(2):141–59.	Expert consensus
Sports Medicine **Gynecologic**	Don't prescribe oral contraceptive pills as initial treatment for patients with amenorrhea	The cause of female athlete triad is an imbalance between energy intake and energy expenditure that leads to menstrual dysfunction (abnormal or loss of periods) and	De Souza MJ, Nattiv A, Joy E, Misra M, Williams NI, Mallinson RJ, Gibbs JC, Olmsted M, Goolsby M, Matheson G; Expert Panel. 2014 Female Athlete Triad Coalition Consensus Statement on Treatment and Return to Play of the Female Athlete Triad. Br J Sports Med.	Expert consensus

Women's health	or menstrual dysfunction due to the female athlete triad (defined as low energy availability with or without disordered eating, menstrual dysfunction, and low bone mineral density). *American Medical Society for Sports Medicine*	low bone mineral density. Historically, some physicians have used oral contraceptive pills to regulate the menstrual cycle in this disorder. However, the underlying cause for the menstrual dysfunction is energy imbalance. Treatment includes increasing caloric intake and/or decreasing energy expenditure (exercise) to restore normal menses, which can take up to 12 months or longer. Additionally, oral contraceptive pills do not increase bone density in females affected by the triad. By restoring menses, oral contraceptive pills can mask energy imbalance and delay appropriate treatment. We recommend a multidisciplinary approach to treatment that includes a physician, dietitian, mental health professional (when appropriate), and support from coaches, family members, and friends.	2014 Feb;48(4):289. Javed A, Tebben PJ, Fischer PR, Lteif AN. Female athlete triad and its components: toward improved screening and management. Mayo Clin Proc. 2013 Sep;88(9): 996–1009. Nazem TG, Ackerman KE. The female athlete triad. Sports Health. 2012 Jul;4(4):302–11.	

Topic area(s)	Recommendation	Rationale and comments	References	Source
Surgical	Avoid routine preoperative testing for low-risk surgeries without a clinical indication. *American Society for Clinical Pathology*	Most preoperative tests (typically a complete blood count, prothrombin time and partial thromboplastin time, basic metabolic panel, and urinalysis) performed on elective surgical patients are normal. Findings influence management in under 3% of patients tested. In almost all cases, no adverse outcomes are observed when clinically stable patients undergo elective surgery, irrespective of whether an abnormal test is identified. Preoperative testing is appropriate in symptomatic patients and those with risks factors for which diagnostic testing can provide clarification of patient surgical risk.	Keay L, et al. Routine preoperative medical testing for cataract surgery. Cochrane Database Syst Rev. 2012;(3):CD007293. Katz R, et al. Survey study of anesthesiologists' and surgeons' ordering of unnecessary preoperative laboratory tests. Anesth Analg. 2011;112(1):207-12. Munro J, et al. Routine preoperative testing: a systematic review of the evidence. Health Technol Assessment. 1997;1(12):i-iv, 1-62. Reynolds TM. National Institute for Health and Clinical Excellence guidelines on preoperative tests: the use of routine preoperative tests for elective surgery. Ann Clin Biochem. 2006;43:13-16. Capdenat Saint-Martin E, et al. Description of local adaptation of national guidelines and of active feedback for rationalizing preoperative screening in patients at low risk from anaesthetics in a French university hospital. Qual Health Care. 1998;7:5-11.	Cochrane Database of Systematic Reviews
Surgical	Avoid admission or preoperative chest x-rays for ambulatory patients with unremarkable history and physical	Performing routine admission or preoperative chest x-rays is not recommended for ambulatory patients without specific reasons suggested by the history and/or physical examination findings. Only 2% of such	American College of Radiology. ACR Appropriateness Criteria: routine admission and preoperative chest radiography. http://www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria/pdf/ExpertPanelonThoracicImaging/RoutineAdmissionandPreoperativeChestRadiographyDoc6.aspx.	ACR Appropriate-ness Criteria

	exam. *American College of Physicians* *American College of Radiology*	images lead to a change in management. Obtaining a chest radiograph is reasonable if acute cardiopulmonary disease is suspected or there is a history of chronic stable cardiopulmonary disease in a patient older than 70 years who has not had chest radiography within six months.	Gomez-Gil E, et al. Lack of clinical relevance of routine chest radiography in acute psychiatric admissions. Gen Hosp Psychiatry. 2002; 24(2):110-3. Archer C, et al. Value of routine preoperative chest x-rays: a meta-analysis. Can J Anaesth. 1993; 40(11):1022-17. Munro J, et al. Routine preoperative testing: a systematic review of the evidence. Health Technol Assessment. 1997;1(12):i-iv; 1-62. Grier DJ, et al. Are routine chest radiographs prior to angiography of any value? Clin Radiol. 1993;48(2):131-3. Gupta SD, et al. Routine chest radiography in the elderly. Age Ageing. 1985;14(1):11-4. American College of Radiology. ACR Appropriateness Criteria: routine chest radiographs in ICU patients. http://www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria/pdf/ExpertPanelonThoracicImaging/RoutineChestRadiographDoc7.aspx.	
Surgical **Cardio-vascular**	Patients who have no cardiac history and good functional status do not require preoperative stress testing prior to noncardiac thoracic surgery. *Society of Thoracic Surgeons*	Functional status has been shown to be reliable for prediction of perioperative and long-term cardiac events. In highly functional asymptomatic patients, management is rarely changed by preoperative stress testing. It is therefore appropriate to proceed with the planned surgery without it. Preoperative stress testing should be reserved for patients with significant clinical risk factors for cardiac complications such as history, symptom, or signs of ischemic heart disease, heart failure, cerebrovascular disease, diabetes mellitus, or peripheral vascular disease. It may also be appropriate to perform preoperative cardiac testing on patients with a low functional status (unable to carry out anything more than minor physical activity) since inactivity in these patients may mask otherwise significant cardiac disease.	Fleisher LA, et al. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for non-cardiac surgery. Circulation. 2007;116:e418-99. Poldermans D, et al. Guidelines for preoperative cardiac risk assessment and perioperative cardiac management in non-cardiac surgery. Eur Heart J. 2009;30:2769-812. Brunelli A, et al. Recalibration of the revised cardiac risk index in lung resection candidates. Ann Thorac Surg. 2010;90:199-203. Wijeysundera DN, et al. Non-invasive cardiac stress testing before elective major non-cardiac surgery: population based cohort study. BMJ. 2010;340:b5526.	ACC/AHA, European Society of Cardiology guidelines
Surgical **Cardio-vascular**	Avoid cardiovascular stress testing for patients undergoing low-risk surgery. *Society for Vascular*	Preoperative stress testing does not alter therapy or decision making in patients facing low-risk surgery.	Fleisher LA, et al. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery. J Am Coll Cardiol. 2007;50:e159-241.	ACC/AHA guideline

	Medicine			
Surgical **Cardio-vascular**	Avoid echocardiograms for preoperative/ perioperative assessment of patients with no history or symptoms of heart disease. *American Society of Echocardiography*	Perioperative echocardiography is used to clarify signs or symptoms of cardiovascular disease, or to investigate abnormal heart tests. Resting left ventricular function is not a consistent predictor of perioperative ischemic events; even reduced left ventricular systolic function has poor predictive value for perioperative cardiac events.	Douglas PS, et al. ACCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/ SCCM/SCCT/SCMR 2011 appropriate use criteria for echocardiography. J Am Soc Echocardiogr. 2011;24:229-67. Fleisher LA, et al. 2009 ACCF/AHA focused update on perioperative beta blockade incorporated into the ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery. J Am Coll Cardiol. 2009;54:e13–118. http://content.onlinejacc.org/article.aspx?articleid =1140211.	ACC/AHA guidelines
Surgical **Cardio-vascular**	Don't order coronary artery calcium scoring for preoperative evaluation for any surgery, irrespective of patient risk. *Society of Cardiovascular Computed Tomography*	No evidence exists to support the diagnostic or prognostic potential of coronary artery calcium scoring in individuals in the preoperative setting. This practice may add costs and confound professional guideline-based evaluations.	Fleisher LA, et al. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery. Circulation. 2007;116(17):e418–99.	ACC/AHA guideline
Surgical **Cardio-vascular**	Don't initiate routine evaluation of carotid artery disease prior to cardiac surgery in the absence of symptoms or other high-risk criteria. *Society of Thoracic Surgeons*	Studies show that the presence of asymptomatic carotid disease in patients undergoing cardiac surgery does not justify preoperative screening in more than the subgroup of "high-risk" patients. Carotid stenosis with symptoms (stroke or transient ischemic attacks) is a known risk for cardiovascular accident and appropriate for preoperative testing. High-risk patients have been defined as patients with left main coronary disease, peripheral artery disease, hypertension, smoking, diabetes mellitus, or age older than 65 years due to a higher rate of asymptomatic carotid stenosis in these patients. The presence a carotid bruit does not equate to an increased risk of stroke after cardiac surgery. Patients with carotid stenosis have a higher rate of cerebrovascular complications after cardiac surgery, but there is no evidence that prophylactic or	Hillis LD, et al. 2011 ACCF/AHA guideline for coronary artery bypass graft surgery. Circulation. 2011;124(23):e652-e735. Stansby G, et al. Asymptomatic carotid disease and cardiac surgery consensus. Angiology. 2011;62:457-60. Tarakji KG, et al. Temporal onset, risk factors, and outcomes associated with stroke after coronary artery bypass grafting. JAMA. 2011;305:381-90. Naylor AR, et al. Stroke after cardiac surgery and its association with asymptomatic carotid disease: An updated systematic review and meta-analysis. Eur J Vasc Endovasc Surg. 2011;41:607-24. Cournot M, et al. Accuracy of the screening physical examination to identify subclinical atherosclerosis and peripheral arterial disease in asymptomatic subjects. J Vasc Surg. 2007;46:1215-21. Ratchford EV, et all. Carotid bruit for detection of hemodynamically significant carotid stenosis: the Northern Manhattan Study. Neurol Res. 2009;31:748-52.	ACC/AHA guideline

		concomitant carotid surgery decreases this rate of complications in asymptomatic patients. Although controversial, the cumulative risk of carotid surgery and cardiac surgery, either sequentially or concomitantly, may exceed the benefit in asymptomatic patients.		
Surgical **Pulmonary medicine**	Prior to cardiac surgery, there is no need for pulmonary function testing in the absence of respiratory symptoms. *Society of Thoracic Surgeons*	Pulmonary function tests can be helpful in determining risk in cardiac surgery, but patients with no pulmonary disease are unlikely to benefit and do not justify testing. Symptoms attributed to cardiac disease that are respiratory in nature should be better characterized with pulmonary function tests.	Shahian DM, et al. The society of thoracic surgeons 2008 cardiac surgery risk models: Part 1–coronary artery bypass grafting surgery. Ann Thorac Surg. 2009;88:S2-22. O'Brien SM, et al. The society of thoracic surgeons 2008 cardiac surgery risk models: Part 2–isolated valve surgery. Ann Thorac Surg. 2009;88:S23-42. Ried M, et al. Mild-to-moderate COPD as a risk factor for increased 30-day mortality in cardiac surgery. Thorac Cardiovasc Surg. 2010;58:387-91. Adabag AS, et al. Preoperative pulmonary function and mortality after cardiac surgery. Am Heart J. 2010;159(4):691-7.	Expert consensus
Surgical	Avoid admission or preoperative chest x-rays for ambulatory patients with unremarkable history and physical exam. *American College of Surgeons*	Performing routine admission or preoperative chest x-rays is not recommended for ambulatory patients without specific reasons suggested by the history and/or physical examination findings. Only 2% of such images lead to a change in management. Obtaining a chest radiograph is reasonable if acute cardiopulmonary disease is suspected or there is a history of chronic stable cardiopulmonary diseases in patients older than age 70 who have not had chest radiography within six months.	Mohammed TL, Kirsch J, Amorosa JK, Brown K, Chung JH, Dyer DS, Ginsburg ME, Heitkamp DE, Kanne JP, Kazerooni EA, Ketai LH, Ravenel JG, Saleh AG, Shah RD, Expert Panel on Thoracic Imaging. ACR Appropriateness Criteria® routine admission and preoperative chest radiography [Internet]. Reston (VA): American College of Radiology (ACR). 2011. 6 p. Gomez-Gil E, Trilla A, Corbella B, Fernández-Egea E, Luburich P, de Pablo J, Ferrer Raldúa J, Valdés M. Lack of clinical relevance of routine chest radiography in acute psychiatric admissions. Gen Hosp Psychiatry. 2002;24(2):110-3. Archer C, Levy AR, McGregor M. Value of routine preoperative chest x-rays: a meta-analysis. Can J Anaesth. 1993;40(11):1022-7. Munro J, Booth A, Nicholl J. Routine preoperative testing: a systematic review of the evidence. Health Technol Assess. 1997;1(12):i-iv:1-62. Grier DJ, Watson LF, Harnell GG, Wilde P. Are routine chest radiographs prior to angiography of any value? Clin Radiol. 1993;48(2):131-3. Gupta SD, Gibbins FJ, Sen I. Routine chest radiography in the elderly. Age Ageing. 1985;14(1):11-4. Amorosa JK, Bramwit MP, Mohammed TL, Reddy GP, Brown K,	ACR Appropriate-ness Criteria

			Dyer DS, Ginsburg ME, Heitkamp DE, Jeudy J, Kirsch J, MacMahon H, Ravenel JG, Saleh AG, Shah RD, Expert Panel on Thoracic Imaging. ACR Appropriateness Criteria® routine chest radiographs in ICU patients. [Internet]. Reston (VA): American College of Radiology (ACR); 2011. 6 p.	
Surgical	Don't perform routine preoperative testing before low-risk surgical procedures. *Society of General Internal Medicine*	Preoperative assessment is expected before all surgical procedures. This assessment includes an appropriately directed and sufficiently comprehensive history and physical examination, and, in some cases, properly includes laboratory and other testing to help direct management and assess surgical risk. However, preoperative testing for low-risk surgical procedures (such as cataract extraction) results in unnecessary delays and adds to significant avoidable costs and should be eliminated.	Keay L, Lindsley K, Tielsch J, Katz J, Schein O. Routine preoperative medical testing for cataract surgery. Cochrane Database Syst Rev. 2012 Mar 14;3:CD007293. Czoski-Murray C, Jones ML, McCabe C, Claxton K, Oluboyede Y, Roberts J, Nicholl JP, Rees A, Reilly CS, Young D, Fleming T. What is the value of routinely testing full blood count, electrolytes and urea, and pulmonary function tests before elective surgery in patients with no apparent clinical indication and in subgroups of patients with common comorbidities: a systematic review of the clinical and cost-effective literature. Health Technol Assess. 2012 Dec;16(50):1-159. Fritsch G, Flamm M, Hepner DL, Panisch S, Seer J, Soennichsen A. Abnormal pre-operative tests, pathologic findings of medical history, and their predictive value for perioperative complications. Acta Anaesthesiol Scand. 2012;56(3):339-50. Benarroch-Gampel J, Sheffield KM, Duncan CB, Brown KM, Han Y, Townsend CM Jr, Riall TS. Preoperative laboratory testing in patients undergoing elective, low-risk ambulatory surgery. Ann Surg. 2012 Sep;256(3):518-28. Van Veen JJ. Spahn DR, Makris M. Routine preoperative coagulation tests: an outdated practice? Br J Anaesth. 2011;106:1-3. Chung F, Yuan H, Yin L, Vairavanathan S, Wong DT. Elimination of preoperative testing in ambulatory surgery. Anesth Analg. 2009 Feb;108(2):467-75. Apfelbaum JL, Connis RT and the Committee on Standards and Practice Parameters. Practice advisory for preanesthesia evaluation: an updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. Anesthesiology. 2012 Mar;116:522-38.	Cochrane Database of Systematic Reviews
Surgical **Infectious disease**	Don't place, or leave in place, peripherally inserted central catheters for patient or provider convenience.	Peripherally inserted central catheters are commonly used devices in contemporary medical practice that are associated with two costly and potentially lethal health care-acquired complications: central-line associated bloodstream infection and venous	Chopra V, Anand S, Krein SL, Chenoweth C, Saint S. Bloodstream infection, venous thrombosis, and peripherally inserted central catheters: reappraising the evidence. Am J Med. 2012;125(8):733-74. Chopra V, Anand S, Hickner A, Buist M, Rogers MA, Saint S, Flanders SA. Risk of venous thromboembolism associated with peripherally inserted central catheters: a systematic review and meta-	Systematic review and meta-analysis

	Society of General Internal Medicine	thromboembolism. Given the clinical and economic consequences of these complications, placement of peripherally inserted central catheters should be limited to acceptable indications (long-term intravenous antibiotics, total parenteral nutrition, chemotherapy and frequent blood draws). Peripherally inserted central catheters should be promptly removed when acceptable indications for their use ends.	analysis. Lancet. 2013 May 17; pii: S0140-6736(13)60592-9. ePub ahead of print. Safdar N, Maki DG. Risk of catheter-related bloodstream infection with peripherally inserted central venous catheters used in hospitalized patients. Chest. 2005;128(2):489-95. Tejedor SC, Tong D, Stein J, Payne C, Dressler D, Xue W, Steinberg JP. Temporary central venous catheter utilization patterns in a large tertiary care center: tracking the "Idle central venous catheter". Infect Control Hosp Epidemiol. 2012 Jan;33(1):50-57.	
Surgical	Don't obtain baseline laboratory studies in patients without significant systemic disease (ASA I or II) undergoing low-risk surgery–specifically complete blood count, basic or comprehensive metabolic panel, coagulation studies when blood loss (or fluid shifts) is/are expected to be minimal. *American Society of Anesthesiologists*	Performing routine laboratory tests in patients who are otherwise healthy is of little value in detecting disease. Evidence suggests that a targeted history and physical exam should determine whether preprocedure laboratory studies should be obtained. The current recommendation from the 2003 ASA amendment that all female patients of childbearing age be offered pregnancy testing rather than required to undergo testing has provided individual physicians and hospitals the opportunity to set their own practices and policies relating to preoperative pregnancy testing. Some institutions respect the right of a patient to refuse testing after a thorough explanation of the anesthetic risks during pregnancy and the required signing of a waiver. The avoidance of the routine administration of the pregnancy test was therefore excluded from our top five preoperative recommendations. The risk specifically related to the surgical procedure could however modify the above preoperative recommendation to obtain laboratory studies and when the need arises; the decision to implement should include a joint decision between the anesthesiologists and surgeons. This should be applicable to all outpatient surgery.	Committee on Standards and Practice Parameters, Apfelbaum JL, Connis RT, Nickinovich DG; American Society of Anesthesiologists Task Force on Preanesthesia Evaluation, Pasternak LR, Arens JF, Caplan RA, Connis RT, Fleisher LA, Flowerdew R, Gold BS, Mayhew JF, Nickinovich DG, Rice LJ, Roizen MF, Twersky RS. Practice advisory for preanesthesia evaluation: an updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. Anesthesiology. 2012 Mar;116(3):522-38. Kumar A, Srivastava U. Role of routine laboratory investigations in preoperative evaluation. J Anaesthesiol Clin Pharmacol. 2011;27(2):174-9. Mollov JL, Twersky RS. (2013). Is routine preoperative pregnancy testing necessary? In: Fleisher L. Evidence-based practice of anesthesiology (3rd ed., pp. 26-30). Philadelphia (PA): Elsevier Saunders. Soares Dde S, Brandao RR, Mourao MR, Azevedo VL, Figueiredo AV, Trindade ES. Relevance of routine testing in low risk patients undergoing minor and medium surgical procedures. Rev Bras Anestesiol. 2013;63(2):197-201. Brown SR, Brown J. Why do physicians order preoperative test? A qualitative study. Fam Med. 2011;43(5):338-43. Czoski-Murray C, Lloyd JM, McCabe C, Claxton K, Oluboyede Y, Roberts J, Nicholls JP, Rees A, Reilly CS, Young D, Fleming T. What is the value of routinely testing full blood count, electrolytes and urea, and pulmonary function test before elective surgery in patients with no apparent clinical indication and in subgroups of patients with common comorbidities: a systematic review of the clinical and cost-effective literature. Health Technol Assess. 2012;16(50):1-159. Katz RI, Dexter F, Rosenfeld K, Wolfe L, Redmond V, Agarwal D,	ASA guideline

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Surgical **Cardio-vascular**	Don't obtain baseline diagnostic cardiac testing (transthoracic/esophageal echocardiography) or cardiac stress testing in asymptomatic stable patients with known cardiac disease (e.g., coronary artery disease, valvular disease) undergoing low or moderate risk noncardiac surgery. *American Society of Anesthesiologists*	Advances in cardiovascular medical management, particularly the introduction of perioperative beta-blockade and improvements in surgical and anesthetic techniques, have significantly decreased operative morbidity and mortality rates in noncardiac surgery. Surgical outcomes continue to improve causing the mortality rate of major surgeries to be low and the need for revascularization minimal. Consequently, the role of preoperative cardiac stress testing has been reduced to the identification of extremely high-risk patients, for instance, those with significant left main disease for which preoperative revascularization would be beneficial regardless of the impending procedure. In other words, testing may be appropriate if the results would change management prior to surgery, could change the decision of the patient to undergo surgery, or change the type of procedure that the surgeon will perform.	Committee on Standards and Practice Parameters, Apfelbaum JL, Connis RT, Nickinovich DG; American Society of Anesthesiologists Task Force on Preanesthesia Evaluation, Pasternak LR, Arens JF, Caplan RA, Connis RT, Fleisher LA, Flowerdew R, Gold BS, Mayhew JF, Nickinovich DG, Rice LJ, Roizen MF, Twersky RS. Practice advisory for preanesthesia evaluation: an updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. Anesthesiology. 2012 Mar;116(3):522-38. Miller AL, Beckman JA. (2013). Which patient should have a preoperative cardiac evaluation (stress test)? In: Fleisher L. Evidence-based practice of anesthesiology (3rd ed., pp. 61–70). Philadelphia (PA): Elsevier Saunders. Schiefermueller J, Myerson S, Handa AI. Preoperative assessment and perioperative management of cardiovascular risk. Angiology. 2013;64(2):146-50. Sheffield KM, McAdams PS, Benarroch-Gampel J, Goodwin JS, Boyd CA, Zhang D, Riall TS. Overuse of preoperative cardiac stress testing in medicare patients undergoing elective noncardiac surgery. Ann Surg. 2013; 257(1):73-80. Almanaseer Y, Mukherjee D, Kline-Rogers EM, Kesterson SK, Sonnad SS, Roges B, Smith D, Furney S, Ernst R, McCort J, Eagle KA. Implementation of the ACC/AHA guidelines for preoperative cardiac risk assessment in a general medicine preoperative clinic: improving efficiency and preserving outcomes. Cardiology. 2005;103(1):24-9. Cinello M, Nucifora G, Bertolissi M, Badano LP, Fresco C, Gonano N, Fioretti PM. American College of Cardiology/American Heart Association perioperative assessment guidelines for noncardiac surgery reduces cardiologic resource utilization preserving favorable outcome. J Cardiovasc Med. 2007;8(11):882-8. Augoustides JG, Neuman MD, Al-Ghofaily L, Silvay G. Preoperative cardiac risk assessment for noncardiac surgery: defining costs and risks. J Cardiothorac Vasc Anesth. 2013;27(2):395-9.	ASA guideline

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Surgical	Don't routinely administer colloid (dextrans, hydroxylethyl starches, albumin) for volume resuscitation without appropriate indications. *American Society of Anesthesiologists*	There is no evidence from multiple randomized controlled trials and recent reviews/meta-analyses that resuscitation with colloids reduces the risk of death compared to crystalloids. Colloids offer no survival benefit and are considerably more expensive than crystalloids; their continued routine use in clinical practice should therefore be questioned. Recent perioperative data on the use of colloids in certain populations remain controversial; nevertheless, there is consensus on the avoidance of the routine use of colloids for volume resuscitation in the general surgical population given the overwhelming amount of evidence in the literature of possible harm when used in un-indicated patients. Health care providers should refer to the current evolving literature when faced with specific conditions like sepsis, traumatic brain injury, acute renal injury and burns thereby creating a forum for discussion among the care providers of the efficacy of such a treatment in that individual patient. Nevertheless, it is important to note that the endpoint in most studies is mortality and morbidity. There is insufficient data to adequately address the need of colloids over crystalloids for other endpoints of interest like hypotension, need for blood transfusion, length of hospital stay, etc. Further research may be required to delineate the existence of any particular benefits of colloids over crystalloids.	Committee on Standards and Practice Parameters, Apfelbaum JL, Connis RT, Nickinovich DG; American Society of Anesthesiologists Task Force on Preanesthesia Evaluation, Pasternak LR, Arens JF, Caplan RA, Connis RT, Fleisher LA, Flowerdew R, Gold BS, Mayhew JF, Nickinovich DG, Rice LJ, Roizen MF, Twersky RS. Practice advisory for preanesthesia evaluation: an updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. Anesthesiology. 2012 Mar;116(3):522–38. Perel P, Roberts I, Pearson M. Colloid versus crystalloid for fluid resuscitation in critically ill patients (Review). The Cochrane Collaboration, the Cochrane Library 2009;3. Perel P, Roberts I, Ker K. Colloids versus crystalloids for fluid resuscitation in critically ill patients. Cochrane Database Syst Rev. 2013 Feb 28;2. Perel P, Roberts I. Colloids versus crystalloids for fluid resuscitation in critically ill patients. Cochrane Database Syst Rev. 2012 Jun 13;6. Perel P, Roberts I. Colloids versus crystalloids for fluid resuscitation in critically ill patients. Cochrane Database Syst Rev. 2011 Mar 16;(3):CD000567. Perel P, Roberts I. Colloids versus crystalloids for fluid resuscitation in critically ill patients. Cochrane Database Syst Rev. 2007 Oct 17;(4):CD000567. Roberts I, Alderson P, Bunn F, Chinnock P, Ker K, Schierhout G. Colloids versus crystalloids for fluid resuscitation in critically ill patients. Cochrane Database Syst Rev. 2004 Oct 18;(3):CD000567. Kruer RM Ensor CR. Colloids in the intensive care unit. Am J Health Syst Pharm. 2012 Oct 1;69(19):1635–42. NATA: Network for Advancement and Transfusion Alternatives. Crystalloids versus colloids: the controversy [Internet]. NATA. 2013 [cited 2013 Sep 20]. Available from: http://www.nataonline.com/np/158/crystalloids-versus-colloids-controversy.	Cochrane Database of Systematic Reviews

			Reinhart K, Perner A, Sprung CL, Jaeschke R, Schortgen F, Johan Groeneveld AB, Beale R, Hartog CS; European Society of Intensive Care Medicine. Consensus statement of the ESICM task force on colloid volume therapy in critically ill patients. Intensive Care Med. 2012;38(3):368-83.	
Surgical **Infectious disease**	Don't routinely use topical antibiotics on a surgical wound. *American Academy of Dermatology*	The use of topical antibiotics on clean surgical wounds has not been shown to reduce the rate of infection compared to the use of non-antibiotic ointment or no ointment. Topical antibiotics can aggravate open wounds, hindering the normal wound-healing process. When topical antibiotics are used in this setting, there is a significant risk of developing contact dermatitis, a condition in which the skin becomes red, sore, or inflamed after direct contact with a substance, along with the potential for developing antibiotic resistance. Only wounds that show symptoms of infection should receive appropriate antibiotic treatment.	Dixon AJ, Dixon MP, Dixon JB. Randomized clinical trial of the effect of applying ointment to surgical wounds before occlusive dressing. Br J Surg. 2006 Aug;93(8):937-43. Smack DP, Harrington AC, Dunn C, Howard RS, Szkutnik AJ, Krivda SJ, Caldwell JB, James WD. Infection and allergy incidence in ambulatory surgery patients using white petrolatum vs bacitracin ointment. A randomized controlled trial. JAMA. 1996 Sep 25;276(12):972-7. Campbell RM, Perlis CS, Fisher E, Gloster HM Jr. Gentamicin ointment versus petrolatum for management of auricular wounds. Dermatol Surg. 2005 Jun;31(6):664-9. Sheth VM, Weitzul S. Postoperative topical antimicrobial use. Dermatitis. 2008 Jul-Aug;19(4):181-9. Gehrig KA, Warshaw EM. Allergic contact dermatitis to topical antibiotics: epidemiology, responsible allergens, and management. J Am Acad Dermatol. 2008 Jan;58(1):1-21.	RCTs
Surgical **Cardio-vascular**	Don't perform cardiac imaging as a preoperative assessment in patients scheduled to undergo low- or intermediate-risk noncardiac surgery. *American Society of Nuclear Cardiology*	Noninvasive testing is not useful for patients undergoing low-risk noncardiac surgery or with no cardiac symptoms or clinical risk factors undergoing intermediate-risk noncardiac surgery. These types of testing do not change the patient's clinical management or outcomes and will result in increased costs. Therefore, it is not appropriate to perform cardiac imaging procedures for noncardiac surgery risk assessment in patients with no cardiac symptoms, clinical risk factors, or who have moderate to good functional capacity.	Hendel RC, Berman DS, Di Carli MF, Heidenreich PA, Henkin RE, Pellikka PA, Pohost GM, Williams KA. ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 appropriate use criteria for cardiac radionuclide imaging: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the American Society of Nuclear Cardiology, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the Society of Cardiovascular Computed Tomography, the Society for Cardiovascular Magnetic Resonance, and the Society of Nuclear Medicine. J Am Coll Cardiol. 2009;53:2201-29. Fleisher LA, Beckman JA, Brown KA, Calkins H, Chaikof EL, Fleischmann KE, Freeman WK, Froehlich JB, Kasper EK, Kersten JR, Riegel B, Robb JF. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines on Perioperative Cardiovascular Evaluation for	ACC/AHA guidelines

			Noncardiac Surgery). J Am Coll Cardiol. 2007;50:e159-242.	
Surgical, **Cardio-vascular**	Don't perform stress cardiovascular magnetic resonance as a preoperative assessment in patients scheduled to undergo low-risk, noncardiac surgery. *Society for Cardiovascular Magnetic Resonance*	Stress testing has not been shown to be useful in patients undergoing low-risk surgery. Therefore, stress cardiovascular magnetic resonance in these patients will not improve outcomes and will increase cost.	Hendel RC, Patel MR, Kramer CM, Poon M, Hendel RC, Carr JC, Gerstad NA, Gillam LD, Hodgson JM, Kim RJ, Kramer CM, Lesser JR, Martin ET, Messer JV, Redberg RF, Rubin GD, Rumsfeld JS, Taylor AJ, Weigold WG, Woodard PK, Brindis RG, Hendel RC, Douglas PS, Peterson ED, Wolk MJ, Allen JM, Patel MR. ACCF/ACR/SCCT/SCMR/ASNC/NASCI/SCAI/SIR 2006 appropriateness criteria for cardiac computed tomography and cardiac magnetic resonance imaging. J Am Coll Cardiol. 2006 Oct 3;48(7):1475–97. American College of Radiology; Society of Cardiovascular Computed Tomography; Society for Cardiovascular Magnetic Resonance; American Society of Nuclear Cardiology; North American Society for Cardiac Imaging; Society for Cardiovascular Angiography and Interventions; Society of Interventional Radiology. ACCF/ACR/SCCT/SCMR/ASNC/NASCI/SCAI/SIR 2006 appropriateness criteria for cardiac computed tomography and cardiac magnetic resonance imaging. J Am Coll Radiol. 2006 Oct;3(10):751–71. Fleisher LA, Beckman JA, Brown KA, Calkins H, Chaikof EL, Fleischmann KE, Freeman WK, Froehlich JB, Kasper EK, Kersten JR, Riegel B, Robb JF, Smith SC Jr, Jacobs AK, Adams CD, Anderson JL, Antman EM, Buller CE, Creager MA, Ettinger SM, Faxon DP, Fuster V, Halperin JL, Hiratzka LF, Hunt SA, Lytle BW, Nishimura R, Ornato JP, Page RL, Riegel B, Tarkington LG, Yancy CW. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery. J Am Coll Cardiol. 2007 Oct 23;50(17):1707–32.	ACC/AHA guideline
Surgical	Don't use whirlpools for wound management. *American Physical Therapy Association*	Whirlpools are a non-selective form of mechanical debridement. Utilizing whirlpools to treat wounds predisposes the patient to risks of bacterial cross-contamination, damage to fragile tissue from high turbine forces, and complications in extremity edema when arms and legs are treated in a dependent position in warm water. Other more selective forms of hydrotherapy should be utilized, such as directed wound irrigation or a pulsed lavage with suction.	Institute for Clinical Systems Improvement (ICSI). Pressure ulcer prevention and treatment protocol. Health care protocol. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2012 Jan. 88 p. Association for the Advancement of Wound Care (AAWC) venous ulcer guideline. Malvern (PA): Association for the Advancement of Wound Care (AAWC); 2010 Dec. 7 p. Water use in hydrotherapy tanks [Internet]. Atlanta (GA): Centers for Disease Control and Prevention. 2009 Aug 10 [cited 2014 Apr 23]. Available from: http://www.cdc.gov/healthywater/other/medical/hydrotherapy.html. Berrouane YF, McNutt LA, Buschelman BJ. Outbreak of severe	Institute for Clinical Systems Improvement guideline

			pseudomonas aeruginosa infections caused by a contaminated drain in a whirlpool bathtub. Clin Infect Dis. 2000;31(6):1331–7. McCulloch J, Boyd VB. The effects of whirlpool and the dependent position on lower extremity volume. J Orthop Sports Phys Ther. 1992;16(4):169–73.	

Topic area(s)	Recommendation	Rationale and comments	References	Source
Urologic **Pediatric**	Don't perform ultrasound on boys with cryptorchidism. *American Urological Association*	Ultrasound has been found to have poor diagnostic performance in the localization of testes that cannot be felt through physical examination. Studies have shown that the probability of locating testes was small when using ultrasound, and there was still a significant chance that testes were present even after a negative ultrasound result. Additionally, ultrasound results are complicated by the presence of surrounding tissue and bowel gas present in the abdomen.	Tasian G, et al. Diagnostic performance of ultrasound in nonpalpable cryptorchidism: a systematic review and meta-analysis. Pediatrics. 2011;127(1):119-28.	Systematic review and meta-analysis
Urologic	Don't prescribe testosterone to men with erectile dysfunction who have normal testosterone levels. *American Urological Association*	While testosterone treatment is shown to increase sexual interest, there appears to be no significant influence on erectile function. The information available in studies to date is insufficient to fully evaluate testosterone's efficacy in the treatment of men with erectile dysfunction who have normal testosterone levels.	American Urological Association. Management of erectile dysfunction clinical practice guideline. http://www.auanet.org/ content/clinical-practice-guidelines/clinical-guidelines.cfm?sub =ed.	AUA guideline
Urologic	Don't order creatinine or upper-tract imaging for patients with benign prostatic hyper-plasia. *American Urological Association*	When an initial evaluation shows only the presence of lower urinary tract symptoms, if the symptoms are not significantly bothersome to the patient or if the patient doesn't desire treatment, no further evaluation is recommended. Such patients are unlikely to experi-ence significant health problems in the future due to their condition and can be seen again if necessary. (While the patient can often tell the provider if the symptoms are bothersome enough that he desires additional therapy, another possible option is to use a validated questionnaire to assess symptoms. For example, if the patient completes the International Prostate Symptom Scale and has a symptom score of 8 or	American Urological Association. Management of the benign prostatic hyperplasia clinical practice guideline. http://www. auanet.org/content/guidelines-and-quality-care/clinical-guidelines.cfm?sub=bph.	AUA guideline

		greater, this is considered to be "clinically" bothersome.)		
Urologic	Don't treat an elevated PSA with antibiotics for patients not experiencing other symptoms. *American Urological Association*	It had previously been suggested that a course of antibiotics might lead to a decrease in an initially raised PSA and reduce the need for prostate biopsy; however, there is a lack of clinical studies to show that antibiotics actually decrease PSA levels. It should also be noted that a decrease in PSA does not indicate an absence of prostate cancer. There is no information available on the implications of deferring a biopsy following a decrease in PSA.	Heldwein FL, et al. Antibiotics and observation have a similar impact on asymptomatic patients with a raised PSA. BJU Int. 2011;107(10):1576-81. Stopliglia RM, et al. Prostate specific antigen and prostate cancer diagnosis: antibiotic versus placebo prospective randomized clinical trial. J Urol. 2010;183(3):940-4.	RCT
Urologic	Don't place, or leave in place, urinary catheters for incontinence or convenience or monitoring of output for non–critically ill patients (acceptable indications: critical illness, obstruction, hospice, periopera-tively for < 2 days for urologic procedures; use weights instead to monitor diuresis). *Society of Hospital Medicine (Adult)*	Catheter-associated urinary tract infections are the most common (frequently occurring) health care–acquired infection. Use of urinary catheters for incontinence or convenience without proper indication or specified optimal duration of use increases the likelihood of infection and is commonly associated with greater morbidity, mortality and health care costs. Published guidelines suggest that hospitals and long-term care facilities should develop, maintain, and promulgate policies and procedures for recommended catheter insertion indications, insertion and maintenance techniques, discontinuation strategies, and replacement indications.	Hooton TM, et al. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults. Clin Infect Dis. 2010;50(5):625-63. Saint S, et al. Catheter-associated urinary tract infection and the Medicare rule changes. Ann Intern Med. 2009;150(12):877-84. Centers for Medicare & Medicaid Services, Joint Commission. Standards for hospital care, surgical Care Improvement Project (SCIP), SCIP-Inf-9; Performance measure name: urinary catheter removed on postoperative day 1 (POD 1) or postoperative day 2 (POD 2) with day of surgery being day zero. 2013. 2013 Joint Commission National Hospital Inpatient Quality Measures Specification Manual, version 4.11.	IDSA guideline, Joint Commission
Urologic **Oncologic**	Don't initiate management of low-risk prostate cancer without discussing active surveillance. *American Society for Radiation Oncology*	Patients with prostate cancer have a number of reasonable management options. These include surgery and radiation, as well as conservative monitoring without therapy in appropriate patients. Shared decision-making between the patient and the physician can lead to better alignment of patient goals with treatment and more efficient care delivery. The American Society for Radiation Oncology has published patient-directed written decision aids concerning prostate	Dahabreh IJ, Chung M, Balk EM, Yu WW, Mathew P, Lau J, Ip S. Active surveillance in men with localized prostate cancer: a systematic review. Ann Intern Med. 2012 Apr 17;156(8):582-90. Wilt TJ, Brawer MK, Jones KM, Barry MJ, Aronson WJ, Fox S, Gingrich JR, Wei JT, Gilhooly P, Grob BM, Nsouli I, Iyer P, Cartagena R, Snider G, Roehrborn C, Sharifi R, Blank W, Pandya P, Andriole GL, Culkin D, Wheeler T; Prostate Cancer Intervention versus Observation Trial (PIVOT) Study Group. Radical prostatectomy versus observation for localized prostate cancer. N Engl J Med. 2012 Jul 19;367(3):203-13. Bill-Axelson A, Holmberg L, Ruutu M, Garmo H, Stark JR, Busch C,	Systematic review

		cancer and numerous other types of cancer. These types of instruments can give patients confidence about their choices, improving compliance with therapy.	Nordling S, Häggman M, Andersson SO, Bratell S, Spångberg A, Palmgren J, Steineck G, Adami HO, Johansson JE; SPCG-4 Investigators. Radical prostatectomy versus watchful waiting in early prostate cancer. N Engl J Med. 2011 May 5;364(18):1708-17. Thompson I, Thrasher JB, Aus G, Burnett AL, Canby-Hagino ED, Cookson MS, D'Amico AV, Dmochowski RR, Eton DT, Forman JD, Goldenberg SL, Hernandez J, Higano CS, Kraus SR, Moul JW, Tangen CM; AUA Prostate Cancer Clinical Guideline Update Panel. Guideline for the management of clinically localized prostate cancer: 2007 update. J Urol. 2007 Jun;177(6):2352-6. Klotz L, Zhang L, Lam A, Nam R, Mamedov A, Loblaw A. Clinical results of long-term follow-up of a large, active surveillance cohort with localized prostate cancer. J Clin Oncol. 2010 Jan 1;28(1):126-31. Stacey D, Bennett CL, Barry MJ, Col NF, Eden KB, Holmes-Rovner M, Llewellyn-Thomas H, Lyddiatt A, Légaré F, Thomson R. Decision aids for people facing health treatment or screening decisions. Cochrane Database Syst Rev. 2011 Oct 5;10:CD001431.	
Urologic	Don't prescribe testosterone therapy unless there is laboratory evidence of testosterone deficiency. *American Society for Clinical Pathology*	With the increased incidence of obesity and diabetes, there may be increasing numbers of older men with lower testosterone levels that do not fully meet diagnostic or symptomatic criteria for hypogonadism. Current clinical guidelines recommend making a diagnosis of androgen deficiency only in men with consistent symptoms and signs coupled with unequivocally low serum testosterone levels. Serum testosterone should only be ordered in patients exhibiting signs and symptoms of androgen deficiency.	Layton JB, Li D, Meier CR, Sharpless JL, Stürmer T, Jick SS, Brookhart MA. Testosterone lab testing and initiation in the United Kingdom and the United States, 2000 to 2011. J Clin Endocrinol Metab. 2014;99(3):835-42. Bhasin D, Cunningham GF, Hayes FJ, Matsumoto AM, Snyder PJ, Swerdloff RS, Montori VM; Task Force, Endocrine Society. Testosterone therapy in adult men with androgen deficiency syndromes: an Endocrine Society clinical practice guideline. J Clin Endocrinol Metab. 2010;95(6):2536-59. Liverman CT, Blaze DG, eds. Testosterone and aging: clinical research directions. Washington, DC: The National Academies Press; 2004.	Endocrine Society guidelines
Urologic **Geriatrics**	Don't place an indwelling urinary catheter to manage urinary incontinence. *The Society for Post-Acute and Long-Term Care Medicine*	The most common source of bacteremia in the post-acute and long-term care setting is the bladder when an indwelling urinary catheter is in use. The federal Healthcare Infection Control Practices Advisory Committee recommends minimizing urinary catheter use and duration of use in all patients. Specifically, the Healthcare Infection Control Practices Advisory Committee recommends not using a catheter to manage urinary	CMS Manual System Pub. 100-07 State Operations Provider Certification. Transmittal 8. Revision of Appendix PP–Section 483.25(d)–Urinary Incontinence, Tags F315 and F316. Centers for Medicare and Medicaid Services, U.S. Department of Health and Human Services; 2005 Jun 28 [cited 2014 Dec 31]. Available from: https://www.cms.gov/Regulations-and-Guidance/Guidance/Transmittals/downloads/r8som.pdf. Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA; Healthcare Infection Control Practices Advisory Committee. Guideline for prevention of catheter-associated urinary tract infections 2009.	IDSA guideline

		incontinence in the post-acute and long-term care setting. Appropriate indications for indwelling urinary catheter placement include acute retention or outlet obstruction, to assist in healing of deep sacral or perineal wounds in patients with urinary incontinence, and to provide comfort at the end of life if needed.	Infect Control Hosp Epidemiol. 2010 Apr;31(4):319-26. Hooton TM, Bradley SF, Cardenas DD, Colgan R, Geerlings SE, Rice JC, Saint S, Schaeffer AJ, Tambayh PA, Tenke P, Nicolle LE; Infectious Diseases Society of America. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. Clin Infect Dis. 2010 Mar;50(5):625-63.	
Urologic	Don't perform cystoscopy, urodynamics or diagnostic renal and bladder ultrasound in the initial work-up of an uncomplicated overactive bladder patient. *American Urogynecologic Society*	The initial evaluation of an uncomplicated patient presenting with symptoms should include history, physical examination and urinalysis. In some cases, urine culture, post-void residual urine assessment and bladder diaries may be helpful. More invasive testing should be reserved for complex patients, patients who have failed initial therapies (i.e., behavioral therapies and medications), or patients who have abnormal findings on their initial evaluation.	Gormley EA, Lightner DJ, Burgio KL, Chai TC, Clemens JQ, Culkin DJ, Das AK, Foster HE Jr, Scarpero HM, Tessier CD, Vasavada SP; American Urological Association; Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction. Diagnosis and treatment of overactive bladder (non neurognic) in adults: AUA/SUFU guideline. J Urol. 2012 Dec 1;188(6 Suppl):2455-63.	AUA guideline
Urologic **Infectious disease**	Don't prescribe antimicrobials to patients using indwelling or intermittent catheterization of the bladder unless there are signs and symptoms of urinary tract infection. *American Urological Association*	Antibiotics in the absence of signs and symptoms (which may include fever; altered mental status or malaise with no other cause; flank or pelvic pain; flank or suprapubic tenderness; hematuria; dysuria, urinary urgency or frequency; and, in spinal cord injury patients, increased spasticity, autonomic dysreflexia, or sense of unease) is not efficacious and risks inducing resistance to antimicrobials. This applies to both indwelling and intermittent catheterization of the bladder. The major exception is patients needing periprocedural antimicrobials. Additionally, initial placement of a suprapubic tube requires a skin puncture or incision and therefore antibiotics should be considered.	Diagnosis, prevention, and treatment of Catheter-Associated Urinary Tract Infection in adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. [Internet]. Arlington (VA): Infectious Diseases Society of America; 2010 [cited 2014 Nov 4]. Available from: www.auanet.org/common/pdf/education/clinical-guidance/UTI-in-Adults.pdf.	IDSA guideline
Urologic **Oncologic**	Don't obtain computed tomography scan of the pelvis for asymptomatic men with low-risk clinically localized prostate cancer.	Computed tomography scan of the pelvis is very unlikely to provide actionable information in men with low-risk prostate cancer (one commonly accepted definition of low-risk prostate cancer is Gleason score less than 7, PSA less than 20.0 ng/mL, and tumor stage of T2 or less). Magnetic resonance	American Urological Association Prostate-Specific Antigen best practice statement, 2013 Revision [Internet]. Linthicum (MD): American Urological Association; 2013 [cited 2014 Nov 4]. Available from: www.auanet.org/education/guidelines/prostate-specific-antigen.cfm.	American Urological Associationg uideline

	American Urological Association	imaging of the pelvis may be useful in some men considering active surveillance.		
Urologic	Don't diagnose microhematuria solely on the results of a urine dipstick (macroscopic urinalysis). *American Urological Association*	Microhematuria is defined only on urine microscopy: three or more red blood cells per high-powered field on microscopy of a properly collected urinary specimen. Urine dipsticks positive for hemoglobin should be confirmed with urine microscopy, as false positive dipsticks are common. Performing radiographic and cystoscopic evaluation is unnecessary in the absence of microscopically confirmed microhematuria.	Diagnosis, evaluation and follow-up of Asymptomatic Microhematuria (AMH) in adults: American Urological Association Guideline, 2012 [Internet]. Linthicum (MD): American Urological Association; 2012 [cited 2014 Nov 4]. Available from: www.auanet.org/education/guidelines/asymptomatic-microhematuria.cfm.	American Urological Association guideline

AAFP = American Academy of Family Physicians
AAN = American Academy of Neurology
AAO-HNSF = American Academy of Otolaryngology–Head and Neck Surgery Foundation
AAP = American Academy of Pediatrics
ACC = American College of Cardiology
ACCP = American College of Chest Physicians
ACEP = American College of Emergency Physicians
ACOEM = American College of Occupational and Environmental Medicine
ACOG = American College of Obstetricians and Gynecologists
ACP = American College of Physicians
ACR = American College of Radiology
ACS = American Cancer Society
AGS = American Geriatrics Society
AHA = American Heart Association
AHRQ = Agency for Healthcare Research and Quality
ANA = antinuclear antibody
ASA = American Society of Anesthesiologists
ASCCP = American Society for Colposcopy and Cervical Pathology
ASCP = American Society for Clinical Pathology
AUA = American Urological Association
BPSD = behavioral and psychological symptoms of dementia
CAD = coronary artery disease
CT = computed tomography
DEXA = dual-energy x-ray absorptiometry
DMARD = disease-modifying antirheumatic drug
DVT = deep vein thrombosis
GERD = gastroesophageal reflux disease

HPV = human papillomavirus
IDSA = Infectious Diseases Society of America
IgE = immunoglobulin E
IV = intravenous
MRI = magnetic resonance imaging
NICE = National Institute for Health and Clinical Excellence
NIPT = noninvasive prental testing
NOF = National Osteoporosis Foundation
NSAID = nonsteroidal anti-inflammatory drug
OTC = over-the-counter
Pap = Papanicolaou
PE = pulmonary embolism
PSA = prostate-specific antigen
RCT = randomized controlled trial
SSI = sliding scale insulin
USPSTF = U.S. Preventive Services Task Force
V/Q = ventilation/perfusion
VTE = venous thromboembolism.