Choosing Wisely®

An initiative of the ABIM Foundation

Society of General Internal Medicine

SGIM Society of General Internal Medicine

Five Things Physicians and Patients Should Question

1 Don't recommend daily home glucose monitoring in patients with Type 2 diabetes mellitus not using insulin.

Self-monitoring of blood glucose (SMBG) is an integral part of patient self-management in maintaining safe and target-driven glucose control in type 1 diabetes mellitus. However, for patients with type 2 diabetes mellitus who are not on insulin or medications associated with hypoglycemia, daily glucose monitoring has been shown to have small statistically significant, but not clinically important, changes in glucose control, and small, but significant, patient harms are associated with daily glucose monitoring. SMBG as part of a structured program of education and medication modification should be reserved for patients during the titration of their medication doses or during periods of changes in patients' diet and exercise routines.

2 Don't perform routine annual checkups unless patients are likely to benefit; the frequency of checkups should be based on individual risk factors and preferences. During checkups, don't conduct comprehensive physical exams or routine lab testing.

Patients who are likely to benefit from annual checkups include those who are overdue for recommended preventive care, at high risk of undiagnosed chronic illness, rarely see their primary care physician, have low self-rated health, or have a high degree of worry. Patients from historically excluded or marginalized groups, such as racial and ethnic minoritized groups and those with low income, are at increased risk of many health problems and are more likely to benefit from checkups. Patients who do not meet any of these criteria probably do not need a checkup every year and should talk with their doctor about how often checkups should occur. For asymptomatic patients, beyond blood pressure measurement, body mass index (BMI) assessment, and cervical cancer screening for women, a regular screening physical examination has not been shown to improve health. For laboratory testing, current recommendations for patients with previously normal results range from every 3 to 5 years for common tests such as blood glucose and lipid levels.

3 Don't perform routine pre-operative testing before low-risk surgical procedures.

The goal of the preoperative evaluation is to identify, stratify, and reduce risk for major postoperative complications. The crucial elements of this evaluation are a careful history and physical examination. Preoperative testing (including blood and urine testing, chest radiographs and electrocardiograms) prior to low-risk surgical procedures typically does not reclassify the risk estimate established through the history and physical examination, may result in unnecessary delays, lead to downstream risk from additional testing, and add unnecessary costs. Clinicians should not routinely order testing before low-risk surgery.

4 Don't recommend cancer screening in adults with life expectancy of less than 10 years.

Screening for cancer can be lifesaving in at-risk patients. While certain screening tests lead to a reduction in cancer-specific mortality, 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. Furthermore, these patients are more likely to experience 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 cancer screening in patients with life expectancies of less than 10 years.

5 Don't place, or leave in place, peripherally inserted central catheters for patient or provider convenience.

Peripherally inserted central catheters (PICCs) are commonly used devices in medical practice that are associated with costly and potentially lethal healthcare-acquired complications, including central-line associated bloodstream infection (CLABSI) and venous thromboembolism (VTE). Given the clinical and economic consequences of these complications, placement of PICCs should be limited to acceptable indications (e.g., long-term peripherally compatible infusions, non-peripherally compatible infusions, chemotherapy, palliative care, and frequent blood draws). PICCs should be promptly removed when indications for their use end.

Released September 12, 2013; Revised January 31, 2017; Revised November 30, 2022

How This List Was Created

An ad hoc committee of the Society of General Internal Medicine (SGIM) was impaneled, taking advantage of the clinical expertise of members from the Clinical Practice Committee and Evidence-Based Medicine Task Force within the Society. Members of the ad hoc committee were then solicited to determine possible topics for consideration. The topics chosen were selected to meet the goals of the *Choosing Wisely*® campaign, utilizing the unique clinical perspective of members of the Society in ambulatory general medicine as well as hospital-based practice. The final topics were selected by a vote of committee members based on the strength of the existing evidence, the unique standing members of the Society have in addressing the clinical topics selected, as well as contributions the recommendations would make in terms of patient safety, quality and economic impact. The final recommendations were approved by the governing Council of SGIM.

For SGIM's disclosure and conflict of interest policy, please visit www.sgim.org.

Sources

1

Chircop J, Sheffield D, Kotera Y. Systematic Review of Self-Monitoring of Blood Glucose in Patients With Type 2 Diabetes. Nurs Res. 2021 Nov-Dec 01;70(6):487-497. doi: 10.1097/NNR.0000000000000542. PMID: 34292228.

Zhu H, Zhu Y, Leung S-w. Is self-monitoring of blood glucose effective in improving glycaemic control in type 2 diabetes without insulin treatment: a meta-analysis of randomised controlled trials. BMJ Open 2016;6: e010524. doi:10.1136/ bmjopen-2015-010524

The Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. N Engl J Med 1993; 329:977.

Nathan DM, Cleary PA, Backlund JY, et al. Intensive diabetes treatment and cardiovascular disease in patients with Type 1 diabetes. N Engl J Med 2005; 353: 26.

American Diabetes Association. Standards of medical care in diabetes. Diabetes Care 2013;36 Suppl 1:S11.

Pfoh ER, Linfield D, Speaker SL, Roufael JS, Yan C, Misra-Hebert AD, Rothberg MB. Patient Perspectives on Self-Monitoring of Blood Glucose When not Using Insulin: a Cross-sectional Survey. J Gen Intern Med. 2022 May;37(7):1673-1679. doi: 10.1007/s11606-021-07047-2.

Karter AJ, Parker MM, Moffet HH, et al. Longitudinal study of new and prevalent use of self-monitoring of blood glucose. Diabetes Care 2006; 29:1757.

Faas A, Schellevis FG, Van Eijk JT. The efficacy of self-monitoring of blood glucose in NIDDM subjects. A criteria-based literature review. Diabetes Care 1997; 20:1482.

Harris MI, National Health and Nutrition Examination Survey (NHANES III). Frequency of blood glucose monitoring in relation to glycemic control in patients with type 2 diabetes. Diabetes Care 2001; 24:979.

Davis WA, Bruce DG, Davis TM. Is self-monitoring of blood glucose appropriate for all type 2 diabetic patients? The Fremantle Diabetes Study. Diabetes Care 2006; 29:1764.

Franciosi M, Pellegrini F, De Berardis G, et al. Self-monitoring of blood glucose in noninsulin-treated diabetic patients: a longitudinal evaluation of its impact on metabolic control.Diabet Med 2005; 22:900.

O'Kane MJ, Bunting B, Copeland M, et al. Efficacy of self-monitoring of blood glucose in patients with newly diagnosed type 2 diabetes (ESMON study): randomised controlled trial. BMJ 2008; 336:1174.

Peel E, Douglas M, Lawton J. Self-monitoring of blood glucose in type2 diabetes: longitudinal qualitative study of patients' perspectives. BMJ. 2007; 335: 493.

Hou Y-Y, Wei L, Qiu L-B, Wang X-H. Efficacy of blood glucose self-monitoring on glycemic control in patients with non-insulin-treated type 2 diabetes: A meta-analysis. International Journal of Nursing Sciences 2014;1(2):191-195.

Simon J, Gray A, Clarke P, Wade A, Neil A, Farmer A.: Diabetes Glycaemic Education and Monitoring Trial Group Cost effectiveness of self-monitoring of blood glucose in patients with non-insulin treated type 2 diabetes: economic evaluation of data from the DiGEM trial. BMJ 2008; 336: 1177– 1180.

Davidson MB.: Counterpoint: self-monitoring of blood glucose in type 2 diabetic patients not receiving insulin: a waste of money. Diabetes Care 2005; 28: 1531– 153.

Chamberlain JJ, Doyle-Delgado K, Peterson L, Skolnik N. Diabetes Technology: Review of the 2019 American Diabetes Association Standards of Medical Care in Diabetes. Annals of internal medicine. 2019;171(6):415-420. doi:10.7326/M19-1638.

2

Liss DT, Uchida T, Wilkes CL, Radakrishnan A, Linder JA. General Health Checks in Adult Primary Care: A Review. JAMA. 2021;325(22):2294-2306.

Boulware LE, Marinopoulos S, Phillips KA, et al. Systematic review: the value of the periodic health evaluation. Ann Intern Med. 2007;146(4):289-300.

Krogsboll LT, Jorgensen KJ, Gotzsche PC. General health checks in adults for reducing morbidity and mortality from disease. The Cochrane database of systematic reviews. 2019;1:CD009009.

Dyakova M, Shantikumar S, Colquitt JL, et al. Systematic versus opportunistic risk assessment for the primary prevention of cardiovascular disease. Cochrane Database Syst Rev. 2016(1):CD010411.

Oboler SK, Prochazka AV, Gonzales R, Xu S, Anderson RJ. Public expectations and attitudes for annual physical examinations and testing. Ann Intern Med. 2002;136(9):652-659.

Bloomfield HE, Wilt TJ. Evidence Brief: Role of the Annual Comprehensive Physical Examination in the Asymptomatic Adult. In: VA Evidence Synthesis Program Evidence Briefs. Washington (DC)2011.

Final Recommendation Statement: Prediabetes and Type 2 Diabetes Screening. U.S. Preventive Services Task Force. https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/screening-for-prediabetes-and-type-2-diabetes#bootstrap-panel--6. Published 2021. Accessed February 25, 2022.

Takahashi O, Farmer AJ, Shimbo T, Fukui T, Glasziou PP. A1C to detect diabetes in healthy adults: when should we recheck? Diabetes Care. 2010;33(9):2016-2017.

Goff DC, Jr., Lloyd-Jones DM, Bennett G, et al. 2013 ACC/AHA guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation. 2014;129(25 Suppl 2):S49-73.

Morrissey JP, Harris RP, Kincade-Norburn J, et al. Medicare reimbursement for preventive care. Changes in performance of services, quality of life, and health care costs. Med Care. 1995;33(4):315-331.

German PS, Burton LC, Shapiro S, et al. Extended coverage for preventive services for the elderly: response and results in a demonstration population. Am J Public Health. 1995;85(3):379-386.

Patrick DL, Beresford SA, Ehreth J, et al. Interpreting excess mortality in a prevention trial for older adults. Int J Epidemiol. 1995;24 Suppl 1:S27-33.

Belcher DW. Implementing preventive services. Success and failure in an outpatient trial. Arch Intern Med. 1990;150(12):2533-2541.

Beckman AL, Becerra AZ, Marcus A, et al. Medicare Annual Wellness Visit association with healthcare quality and costs. Am J Manag Care. 2019;25(3):e76-e82.

Fowler NR, Campbell NL, Pohl GM, et al. One-Year Effect of the Medicare Annual Wellness Visit on Detection of Cognitive Impairment: A Cohort Study. J Am Geriatr Soc. 2018;66(5):969-975.

Pfoh E, Mojtabai R, Bailey J, Weiner JP, Dy SM. Impact of Medicare Annual Wellness Visits on Uptake of Depression Screening. Psychiatric services (Washington, DC). 2015;66(11):1207-1212.

Somkin CP, McPhee SJ, Nguyen T, et al. The effect of access and satisfaction on regular mammogram and Papanicolaou test screening in a multiethnic population. Med Care. 2004;42(9):914-926.

Finkelstein MM. Preventive screening. What factors influence testing? Can Fam Physician. 2002;48:1494-1501.

Patrick DL, Grembowski D, Durham M, et al. Cost and outcomes of Medicare reimbursement for HMO preventive services. Health Care Financ Rev. 1999;20(4):25-43.

Burton LC, German PS, Shapiro S. A preventive services demonstration. Health status, health behaviors, and cost outcomes 2 years after intervention. The Johns Hopkins Medicare Preventive Services Demonstration Team. Med Care. 1997;35(11):1149-1157.

A controlled trial of multiphasic screening in middle-age: results of the South-East London Screening Study. The South-East London Screening Study Group. Int J Epidemiol. 1977;6(4):357-363.

Jorgensen T, Jacobsen RK, Toft U, Aadahl M, Glumer C, Pisinger C. Effect of screening and lifestyle counselling on incidence of ischaemic heart disease in general population: Inter99 randomised trial. BMJ. 2014;348:g3617.

Olsen DM, Kane RL, Proctor PH. A controlled trial of multiphasic screening. N Engl J Med. 1976;294(17):925-930.

Goroll AH. Toward Trusting Therapeutic Relationships--In Favor of the Annual Physical. N Engl J Med. 2015;373(16):1487-1489.

Merriel SW, Salisbury C, Metcalfe C, Ridd M. Depth of the patient-doctor relationship and content of general practice consultations: cross-sectional study. Br J Gen Pract. 2015;65(637):e545-551.

van Walraven C, Oake N, Jennings A, Forster AJ. The association between continuity of care and outcomes: a systematic and critical review. J Eval Clin Pract. 2010;16(5):947-956.

Friedman GD, Collen MF, Fireman BH. Multiphasic Health Checkup Evaluation: a 16-year follow-up. J Chronic Dis. 1986;39(6):453-463.

Lindholt JS, Sogaard R. Population screening and intervention for vascular disease in Danish men (VIVA): a randomised controlled trial. Lancet (London, England). 2017;390(10109):2256-2265.

Murray DM, Luepker RV, Pirie PL, et al. Systematic risk factor screening and education: a community-wide approach to prevention of coronary heart disease. Prev Med. 1986;15(6):661-672.

Kamstrup-Larsen N, Dalton SO, Gronbaek M, et al. The effectiveness of general practice-based health checks on health behaviour and incidence on non-communicable diseases in individuals with low socioeconomic position: a randomised controlled trial in Denmark. BMJ open. 2019;9(9):e029180.

2

Chang KC-M, Lee JT, Vamos EP, et al. Impact of the National Health Service Health Check on cardiovascular disease risk: a difference-in-differences matching analysis. CMAJ: Canadian Medical Association journal = journal de l'Association medicale canadienne. 2016;188(10):E228-E238.

Robson J, Dostal I, Madurasinghe V, et al. NHS Health Check comorbidity and management: an observational matched study in primary care. The British journal of general practice : the journal of the Royal College of General Practitioners. 2017;67(655):e86-e93.

Hama Y, Masumori K, Tagami H, Fujiwara K, Kusano S. Preassignment examination for personnel on Iwo Jima. Mil Med. 2001;166(8):721-724.

Forster AS, Burgess C, Dodhia H, et al. Do health checks improve risk factor detection in primary care? Matched cohort study using electronic health records. Journal of public health (Oxford, England). 2016;38(3):552-559.

Caley M, Chohan P, Hooper J, Wright N. The impact of NHS Health Checks on the prevalence of disease in general practices: a controlled study. The British journal of general practice : the journal of the Royal College of General Practitioners. 2014;64(625):e516-521.

Kennedy O, Su F, Pears R, Walmsley E, Roderick P. Evaluating the effectiveness of the NHS Health Check programme in South England: a quasi-randomised controlled trial. BMJ Open. 2019;9(9):e029420.

Wilhelmsen L, Berglund G, Elmfeldt D, et al. The multifactor primary prevention trial in Goteborg, Sweden. Eur Heart J. 1986;7(4):279-288.

Engberg M, Christensen B, Karlsmose B, Lous J, Lauritzen T. General health screenings to improve cardiovascular risk profiles: a randomized controlled trial in general practice with 5-year follow-up. J Fam Pract. 2002;51(6):546-552.

Randomised controlled trial evaluating cardiovascular screening and intervention in general practice: principal results of British family heart study. Family Heart Study Group. BMJ. 1994;308(6924):313-320.

Effectiveness of health checks conducted by nurses in primary care: final results of the OXCHECK study. Imperial Cancer Research Fund OXCHECK Study Group. BMJ. 1995;310(6987):1099-1104.

Theobald H, Bygren LO, Carstensen J, Hauffman M, Engfeldt P. Effects of an assessment of needs for medical and social services on long-term mortality: a randomized controlled study. Int J Epidemiol. 1998;27(2):194-198.

Lannerstad O, Sternby NH, Isacsson SO, Lindgren G, Lindell SE. Effects of a health screening on mortality and causes of death in middle-aged men. A prospective study from 1970 to 1974 of mean in Malmo, born 1914. Scand J Soc Med. 1977;5(3):137-140.

Tibblin G, Welin L, Larsson B, Ljungberg IL, Svardsudd K. The influence of repeated health examinations on mortality in a prospective cohort study, with a comment on the autopsy frequency. The study of men born in 1913. Scand J Soc Med. 1982;10(1):27-32.

Skaaby T, Jorgensen T, Linneberg A. Effects of invitation to participate in health surveys on the incidence of cardiovascular disease: a randomized general population study. Int J Epidemiol. 2017;46(2):603-611.

Bender AM, Jorgensen T, Pisinger C. Do high participation rates improve effects of population-based general health checks? Prev Med. 2017;100:269-274.

Pill R, French J, Harding K, Stott N. Invitation to attend a health check in a general practice setting: comparison of attenders and non-attenders. J R Coll Gen Pract. 1988;38(307):53-56.

Waller D, Agass M, Mant D, Coulter A, Fuller A, Jones L. Health checks in general practice: another example of inverse care? BMJ. 1990;300(6732):1115-1118.

Schnittker J, Bacak V. The increasing predictive validity of self-rated health. PLoS One. 2014;9(1):e84933.

3

Angerame MR, Holst DC, Phocas A, Williams MA, Dennis DA, Jennings JM. Usefulness of perioperative laboratory tests in total hip and knee arthroplasty: Are they necessary for all patients? Arthroplasty Today. 2021;7:136-42. doi:10.1016/j.artd.2020.12.001

Benoit A, Bellan L, Wallace M, Toth G, Djukic RR, Ginter-Boyce B, et al. Does eliminating the preoperative history and physical make a difference in low-risk cataract surgery patients? A before and after study of 30-day morbidity and mortality. Canadian Journal of Ophthalmology. 2019;54(5):529-39.

Bock M, Fritsch G, Hepner DL. Preoperative Laboratory Testing. Anesthesiology Clinics. 2016;34(1):43-58.

Borges NM, Thachil J. The relevance of the coagulation screen before surgery. British Journal of Hospital Medicine. 2017;78(10):566-70.

Chen CL, McLeod SD, Lietman TM, Shen H, Boscardin WJ, Chang HP, et al. Preoperative medical testing and falls in Medicare beneficiaries awaiting cataract surgery. Ophthalmology. 2021;128(2):208-15.

Christopher ZK, Bruce MR, Reynolds EG, Spangehl MJ, Bingham JS, Kraus MB. Routine type and screens Are unnecessary for primary total hip and knee arthroplasties at an academic hospital. Arthroplasty Today. 2020;6(4):941-4. doi:10.1016/j.artd.2020.10.006

Coffman J, Tran T, Quast T, Berlowitz MS, Chae SH. Cost conscious care: preoperative evaluation by a cardiologist prior to low-risk procedures. BMJ Open Quality. 2019;8(2):e000481.

Cohn SL. Preoperative evaluation for noncardiac surgery. Annals of Internal Medicine. 2016;165(11):ITC81-ITC96.

Collins PS, Apel PJ, Truong AY, Zarei M, Lozano AJ, Capito AE. The utility of preoperative HbA1c as a standardized protocol in elective carpal tunnel release: A retrospective review of clinical outcomes. Hand. 2020:1558944720919181.

Fischer JP, Shang EK, Nelson JA, Wu LC, Serletti JM, Kovach SJ. Patterns of preoperative laboratory testing in patients undergoing outpatient plastic surgery procedures. Aesthetic Surgery Journal. 2014;34(1):133-41. doi:10.1177/1090820X13515880

González-De La Mora DA, Terán-Martínez E, García Leonardo JI, Ponce-Martínez JR. Impact of preoperative cardiovascular assessment on intraoperative and postoperative cardiovascular complications in cataract surgery. Revista Mexicana de Oftalmologia. 2021;95(4):150-3. doi:10.24875/RMOE.M21000174

Hasan O, Fahad S, Mustafa M, Hashmi P, Noordin S. Does more testing in routine preoperative evaluation benefit the orthopedic patient? Case control study from a resource-constrained setting. Annals of Medicine & Surgery. 2021;66:102439.

Houchens N. Do healthy patients need routine laboratory testing before elective noncardiac surgery? Cleveland Clinic Journal of Medicine. 2015;82(10):664-6.

Irizarry-Alvarado JM, Beltran M, Motoa G, Carpenter EK, Sanchez-Valenzuela MC, Garcia-Saucedo JC, et al. Impact of preoperative testing on patients undergoing ophthalmologic surgery: A retrospective cohort study. American Journal of Medicine. 2021;134(12):1514-21.e1.

Jastrzebski A, Villafranca A, Sethi S, Bellan L. Safety and comparative costs of preoperative assessments for cataract surgery: traditional mandatory assessment versus a novel graded assessment system. Canadian Journal of Anesthesia. 2016;63(7):842-50. doi:10.1007/s12630-016-0626-x

Keay L, Lindsley K, Tielsch J, Katz J, Schein O. Routine preoperative medical testing for cataract surgery. Cochrane Database of Systematic Reviews. 2019;2019(1). doi:10.1002/14651858.CD007293.pub4

Kerai S, Saxena K, Wadhwa B. Preoperative pregnancy testing in surgical patients: How useful is policy of routine testing. Indian Journal of Anaesthesia. 2019;63(10):786-90. doi:10.4103/ija.IJA_293_19

Kling SM, Taylor GA, Philp MM, Poggio JL, Ross HM, Kuo LE. Use of preoperative laboratory testing among low-risk patients undergoing elective anorectal surgery. Journal of Surgical Research. 2022;270:421-9. doi:10.1016/j.jss.2021.08.042

Matsuo M, Takemura Y, Yamazaki M. Limited utility of routine tests prior to ophthalmologic surgery: An observational study in a Japanese hospital. Jma Journal. 2021;4(3):270-6.

Michalak JR, Lin FC, Twiss CO. Review article: Preoperative evaluation and optimization of the geriatric urological patient. Urology Practice. 2017;4(6):499-507. doi:10.1016/j.urpr.2016.10.006

Mishra K, Avila A, Mahran A, Raina R, Sidagam V, Ponsky LE, et al. Preoperative testing for urethroplasty is not associated with outcomes-A NSQIP study. Urology. 2020;139:182-7.

Mutter O, Taylor GA, Grebenyuk E, Kuo LE, Sanserino KA. Utility of routine preoperative laboratory testing for low-risk patients in ambulatory gynecologic surgery. Journal of Minimally Invasive Gynecology. 2021;28(5):1033-40.e1.

O'Neill F, Carter E, Pink N, Smith I. Routine preoperative tests for elective surgery: Summary of updated NICE guidance. BMJ (Online). 2016;354. doi:10.1136/bmj.i3292

Pandya LK, McLaughlin EM, Hudson CO, Nekkanti S, Smith PE, Hade EM, et al. Utility of preoperative laboratory testing in women undergoing suburethral sling. Female Pelvic Medicine & Reconstructive Surgery. 2019;25(2):99-104.

Rodriguez-Borja E, Corchon-Peyrallo A, Aguilar-Aguilar G, Carratala-Calvo A. Utility of routine laboratory preoperative tests based on previous results: Time to give up. Biochemia Medica. 2017;27(3):030902.

Salar O, Holley J, Baker B, Ollivere BJ, Moran CG. Omitting pre-operative coagulation screening tests in hip fracture patients: stopping the financial cascade? Injury. 2014;45(12):1938-41.

Santos ML, Iglesias AC. Impact of using a local protocol in preoperative testing: blind randomized clinical trial. Revista do Colegio Brasileiro de Cirurgioes. 2017;44(1):54-63.

Shields J, Kho KA. Preoperative evaluation for minimally invasive gynecologic surgery: What Is the best evidence and recommendations for clinical practice. Journal of Minimally Invasive Gynecology. 2019;26(2):312-20.

Shields J, Lupo A, Walsh T, Kho K. Preoperative evaluation for gynecologic surgery: a guide to judicious, evidence-based testing. Current Opinion in Obstetrics & Gynecology. 2018;30(4):252-9.

Sousa RJG, Abreu MA, Wouthuyzen-Bakker M, Soriano AV. Is routine urinary screening indicated prior to elective total joint arthroplasty? A systematic review and meta-analysis. Journal of Arthroplasty. 2019;34(7):1523-30. doi:10.1016/j.arth.2019.03.034

Sui W, Theofanides MC, Matulay JT, James MB, Onyeji IC, RoyChoudhury A, et al. Utilization of preoperative laboratory testing for low-risk, ambulatory urologic procedures. Urology. 2016;94:77-84.

Tavirani MR, Abbasi MA, Bagaee M, Tizmaghz A, Khavanin-Zadeh M. Evaluation of preoperative liver function test efficacy in patients with symptomatic cholelithiasis. Gastroenterology and Hepatology from Bed to Bench. 2020;13(3):254-7. doi:10.22037/ghfbb.v13i3.1957

Tay AYW, Thever Y, Bin Abd Razak HR, Hao Y, Tan AHC. Routine preoperative group crossmatching and postoperative check hemoglobin Is not necessary in patients undergoing total knee arthroplasty. Journal of Knee Surgery. 2021;34(12):1359-67. doi:10.1055/s-0040-1709488

3

Taylor GA, Liu JC, Schmalbach CE, Kuo LE. Preoperative laboratory testing among low-risk patients prior to elective ambulatory endocrine surgeries: A review of the 2015-2018 NSQIP cohorts. American Journal of Surgery. 2021;222(3):554-61.

Taylor GA, Oresanya LB, Kling SM, Saxena V, Mutter O, Raman S, et al. Rethinking the routine: Preoperative laboratory testing among American Society of Anesthesiologists class 1 and 2 patients before low-risk ambulatory surgery in the 2017 National Surgical Quality Improvement Program cohort. Surgery (United States). 2022;171(2):267-74. doi:10.1016/j.surg.2021.07.036

Torjesen I. Healthy people need fewer preoperative tests for elective surgery, says NICE. BMJ. 2016;353:i1958.

Wang DS. Re: Utilization of preoperative laboratory testing for low-risk, ambulatory urologic procedures. Journal of Urology. 2016;196(5):1527.

Yazici H, Daşkaya H, Doğan S, Haberal I, Çiftçi T. Patient specific or routine preoperative workup in septoplasty: Which one is cost-effective? European Archives of Oto-Rhino-Laryngology. 2014;271(2):305-9. doi:10.1007/s00405-013-2541-x

Young EM, Farmer JD. Preoperative chest radiography in elective surgery: Review and update. South Dakota Medicine : the journal of the South Dakota State Medical Association. 2017;70(2):81-7.

Zhang Q, Liu L, Sun W, Gao F, Cheng L, Li Z. Research progress of asymptomatic bacteriuria before arthroplasty: A systematic review. Medicine. 2018;97(7):e9810.

Sears S, Mangel J, Adedayo P, Mims J, Sundaresh S, Sheyn D. Utility of preoperative laboratory evaluation in low-risk patients undergoing hysterectomy for benign indications. European Journal of Obstetrics, Gynecology, & Reproductive Biology. 2020;248:144-9.

Ondeck NT, Fu MC, McLynn RP, Bovonratwet P, Malpani R, Grauer JN. Preoperative laboratory testing for total hip arthroplasty: Unnecessary tests or a helpful prognosticator. Journal of Orthopaedic Science. 2020;25(5):854-60. doi:10.1016/j.jos.2019.09.019

Anonymous. Routine preoperative tests for elective surgery: © NICE (2016). BJU International. 2018;121(1):12-6.

Martin SK, Cifu AS. Routine preoperative laboratory tests for elective surgery. JAMA. 2017;318(6):567-8.

National Guideline Centre. National Institute for Health and Care Excellence. 2016;04:04.

4

US Preventive Services Task Force. Screening for Prostate Cancer: US Preventive Services Task Force Recommendation Statement. JAMA. 2018;319(18):1901–1913.

https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/breast-cancer-screening. Accessed 26 Jan 2022.

García-Albéniz X, Hernán MA, Logan RW, Price M, Armstrong K, Hsu J. Continuation of annual screening mammography and breast cancer mortality in women older than 70 years. Annals of internal medicine. 2020 Mar 17;172(6):381-9.

Knudsen AB, Rutter CM, Peterse EF, Lietz AP, Seguin CL, Meester RG, Perdue LA, Lin JS, Siegel RL, Doria-Rose VP, Feuer EJ. Colorectal cancer screening: an updated modeling study for the US Preventive Services Task Force. JAMA. 2021 May 18;325(19):1998-2011.

https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/colorectal-cancer-screening. Accessed 25 Jan 2022.

Qaseem A, Crandall CJ, Mustafa RA, Hicks LA, Wilt TJ, Clinical Guidelines Committee of the American College of Physicians*. Screening for colorectal cancer in asymptomatic average-risk adults: a guidance statement from the American College of Physicians. Annals of internal medicine. 2019 Nov 5;171(9):643-54.

Nelson HD, Pappas M, Cantor A, Griffin J, Daeges M, Humphrey L. Harms of breast cancer screening: systematic review to update the 2009 US Preventive Services Task Force recommendation. Annals of internal medicine. 2016 Feb 16;164(4):256-67

Qaseem A, Lin JS, Mustafa RA, Horwitch CA, Wilt TJ. Screening for breast cancer in average-risk women: a guidance statement from the American College of Physicians. Annals of internal medicine. 2019 Apr 16;170(8):547-60.

Braithwaite D, Walter LC, Izano M, Kerlikowske K. Benefits and Harms of Screening Mammography by Comorbidity and Age: A Qualitative Synthesis of Observational Studies and Decision Analyses. J Gen Intern Med. 2016 May;31(5):561-72

Karakatsanis A, Markopoulos C. The challenge of avoiding over-and under-treatment in older women with ductal cancer in situ: A scoping review of existing knowledge gaps and a meta-analysis of real-world practice patterns. Journal of geriatric oncology. 2020 Jul 1;11(6):917-25.

Grossman DC, Curry SJ, Owens DK, Bibbins-Domingo K, Caughey AB, Davidson KW, Doubeni CA, Ebell M, Epling JW, Kemper AR, Krist AH. Screening for prostate cancer: US Preventive Services Task Force recommendation statement. Jama. 2018 May 8;319(18):1901-13.

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. Annals of internal medicine. 2013 May 21;158(10):761-9.

Mottet N, van den Bergh RC, Briers E, Van den Broeck T, Cumberbatch MG, De Santis M, Fanti S, Fossati N, Gandaglia G, Gillessen S, Grivas N. EAU-EANM-ESTRO-ESUR-SIOG guidelines on prostate cancer—2020 update. Part 1: screening, diagnosis, and local treatment with curative intent. European urology. 2021 Feb 1;79(2):243-62.

https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/lung-cancer-screening. Accessed 26 Jan 2022.

Qaseem A, Crandall CJ, Mustafa RA, Hicks LA, Wilt TJ; Clinical Guidelines Committee of the American College of Physicians, Forciea MA, Fitterman N, Horwitch CA, Kansagara D, Maroto M, McLean RM, Roa J, Tufte J. Screening for Colorectal Cancer in Asymptomatic Average-Risk Adults: A Guidance Statement From the American College of Physicians. Ann Intern Med. 2019 Nov 5;171(9):643-654. Erratum in: Ann Intern Med. 2020 Apr 7;172(7):512

Walter LC and Covinsky KE. Cancer screening in elderly patients: a framework for individualized decision making. JAMA 2001; 285:2750-6.

Lee SJ, Kim CM. Individualizing prevention for older adults. Journal of the American Geriatrics Society. 2018 Feb;66(2):229-34.

Demb J, Akinyemiju T, Allen I, Onega T, Hiatt RA, Braithwaite D. Screening mammography use in older women according to health status: a systematic review and meta-analysis. Clinical interventions in aging. 2018;13:1987.

Hoffmann TC, Del Mar C. Clinicians' Expectations of the Benefits and Harms of Treatments, Screening, and Tests: A Systematic Review. JAMA Intern Med. 2017 Mar 1;177(3):407-419.

Enns JP, Pollack CE, Boyd CM, Massare J, Schoenborn NL. Discontinuing Cancer Screening for Older Adults: a Comparison of Clinician Decision-Making for Breast, Colorectal, and Prostate Cancer Screenings. J Gen Intern Med. 2022 Apr;37(5):1122-1128.

Yourman LC, Lee SJ, Schonberg MA, Widera EW, Smith AK. Prognostic indices for older adults: A systematic review. JAMA. 2012;307:182-192.

ePrognosis. Estimating prognosis for elders. http://www.eprognosis.org. Accessed 26 Jan 2022.

Lee AK, Jing B, Jeon SY, Boscardin WJ, Lee SJ. Predicting Life Expectancy to Target Cancer Screening Using Electronic Health Record Clinical Data. J Gen Intern Med. 2022 Feb;37(3):499-506.

Smith J, Dodd RH, Gainey KM, Naganathan V, Cvejic E, Jansen J, McCaffery KJ. Patient-Reported Factors Associated With Older Adults' Cancer Screening Decision-making: A Systematic Review. JAMA Network Open. 2021 Nov 1;4(11):e2133406-.

Schoenborn NL, Boyd CM, Lee SJ, Cayea D, Pollack CE. Communicating About Stopping Cancer Screening: Comparing Clinicians' and Older Adults' Perspectives. Gerontologist. 2019 May 17;59(Suppl 1):S67-S76.

5

Chopra V, Flanders S, Saint S, et.al. The Michigan appropriateness guide for intravenous catheters (MAGIC): results from a multispecialty panel using the RAND/UCLA appropriateness method. Ann Intern Med. 2015; 163: S1-S39.

Ajenjo MC, Morley JC, Russo AJ, et al. Peripherally inserted central venous catheter-associated bloodstream infections in hospitalized adult patients. Infect Control Hosp Epidemiol. 2011; 32(2):125-130.

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):733-741.

Pongruangporn M, Ajenjo MC, Russo AJ, et al. Patient-and device-specific risk factors for peripherally inserted central venous catheter-related bloodstream infections. Infect Control Hosp Epidemiol. 2013; 34(2):184-189.

Chopra V, O'Horo JC, Rogers MA, et al. The risk of bloodstream infection associated with peripherally inserted central catheters compared with central venous catheters in adults: A systematic review and meta-analysis. Infect Control Hosp Epidemiol. 2013; 34 (9): 908-918.

Aw A, Carrier M, Koczerginski J, McDiarmid S, Tay J. Incidence and predictive factors of symptomatic thrombosis related to peripherally inserted central catheters in chemotherapy patients. Thrombosis Research. 2012; 130(3):323-326.

Evans RS, Sharp JH, Linford LH, et al. Risk of symptomatic DVT associated with peripherally inserted central catheters. Chest. 2010; 138(4):803-810.

Leung A, Heal C, Perera M, Pretorius C. A systemic review of patient-related risk factors for catheter-related thrombosis. J Thromb Thrombolysis. 2015; 40 (3): 363-373.

Fallouh N, McGuirk HM, Flanders S, Chopra V. Peripherally inserted central catheter-associated deep venous thrombosis: A narrative review. Am J Med. 2015; 128 (7): 722-738.10.

Chopra V, Anand S, Hickner A, et al. The risk of venous thromboembolism associated with peripherally inserted central catheters: a systematic review and meta-analysis. Lancet. 2013; 382: 311-325.

Alport B, Burbridge B, Lim H. Bard PowerPICC Solo2 vs Cook Turbo-Ject: A tale of two PICCs. Can Assoc Radiol J. 2012; 63(4): 323-328.

Miyagaki H, Nakajima K, Hara J, et. al. Performance comparison of peripherally inserted central venous catheters in gastrointestinal surgery: A randomized controlled trial. Clin Nutr. 2012; 31: 48-52.

Mitchell MD, Agarwal R, Hecht THE, Umscheid CA. Nonpharmacologic interventions for prevention of catheter-related thrombosis: A systematic review. J Crit Care. 2013; 28: 316.e9-316.e16.

Lyons MG, Phalen AG. A randomized controlled comparison of flushing protocols in home care patients with peripherally inserted central catheters. J Infus Nurs. 2014; 37 (4): 270-281.

Safdar N, Maki DG. Risk of catheter-related bloodstream infection with peripherally inserted central venous catheters used in hospitalized patients. Chest. 2005;128(2):489-495.

Saber W, Moua T, Williams EC, et al. Risk factors for catheter-related thrombosis (CRT) in cancer patients: a patient-level data (IPD) meta-analysis of clinical trials and prospective studies. J Thromb Haemost. 2011;9(2):312-319.

Pikwer A, Akeson J, Lindgren S. Complications associated with peripheral or central routes for central venous cannulation. Anaesthesia. 2012;67(1):65-71.

Beccaria P, Silvetti S, Mucci M, et.al. Contributing factors for a late spontaneous peripherally inserted central catheter migration: A case report and review of literature. J Vasc Access. 2015; 16(3):178-182.

El Ters MJ, Schears GJ, Taler SJ, et.al. Association between prior peripherally inserted central catheters and lack of functioning arteriovenous fistulas: A case-control study in hemodialysis patients. Am J Kidney Dis. 2012; 60 (4): 601-608.

Vascular Access 2006 Work Group. Clinical practice guidelines for vascular access. Am J Kidney Dis. 2006; 48: S176-247.

Tejedor SC, Tong D, Stein J, et al. Temporary central venous catheter utilization patterns in a large tertiary care center: Tracking the "Idle central venous catheter". Infect Control Hosp Epidemiol. 2012;33(1):50-57.

Chopra V, Kuhn LK, Coffey C, et al. Hospitalist experiences, practice, opinions and knowledge regarding peripherally inserted central catheters: a Michigan survey. J Hosp Med. 2013; 8(11): 635-638.

Chopra V, Govindan S, Kuhn L, et. al. Do clinicians know which of their patients have central venous catheters? Ann Intern Med. 2014; 161: 562-567.

Son CH, Daniels TL, Eagan JA, et al. Central line-associated bloodstream infection surveillance outside the intensive care unit: a multicenter survey. Infect Control Hosp Epidemiol. 2012; 33(9):869-874.

Schears GJ, Ferko N, Syed I, Arpino JM, Alsbrooks K. Peripherally inserted central catheters inserted with current best practices have low deep vein thrombosis and central line-associated bloodstream infection risk compared with centrally inserted central catheters: A contemporary meta-analysis. J Vasc Access. 2021;22(1):9-25. doi:10.1177/11297298209161

Balsorano P, Virgili G, Villa G, et al. Peripherally inserted central catheter-related thrombosis rate in modern vascular access era-when insertion technique matters: A systematic review and meta-analysis. J Vasc Access. 2020;21(1):45-54. doi:10.1177/1129729819852203

Yu C, Shulan L, Juan W, Ling L, Chun-Mei L. The accuracy and safety of using the electrocardiogram positioning technique in localizing the peripherally inserted central catheter tip position: A systematic review and meta-analysis [published online ahead of print, 2021 Jun 16]. Nurs Open. 2021;10.1002/nop2.932. doi:10.1002/nop2.932

Okano H, Mayumi T, Kataoka Y, et al. Outcomes of Simulation-Based Education for Vascular Access: A Systematic Review and Meta-Analysis. Cureus. 2021;13(8):e17188. Published 2021 Aug 15. doi:10.7759/cureus.17188

Liu G, Hou W, Zhou C, et al. Meta-analysis of intracavitary electrocardiogram guidance for peripherally inserted central catheter placement. J Vasc Access. 2019;20(6):577-582. doi:10.1177/1129729819826028

Luo X, Guo Y, Yu H, Li S, Yin X. Effectiveness, safety and comfort of StatLock securement for peripherally-inserted central catheters: A systematic review and meta-analysis. Nurs Health Sci. 2017;19(4):403-413. doi:10.1111/nhs.12361

Kramer RD, Rogers MA, Conte M, Mann J, Saint S, Chopra V. Are antimicrobial peripherally inserted central catheters associated with reduction in central line-associated bloodstream infection? A systematic review and meta-analysis. Am J Infect Control. 2017;45(2):108-114. doi:10.1016/j.ajic.2016.07.021

Ma D, Cheng K, Ding P, Li H, Wang P. Self-management of peripherally inserted central catheters after patient discharge via the WeChat smartphone application: A systematic review and meta-analysis. PLoS One. 2018;13(8):e0202326. Published 2018 Aug 28. doi:10.1371/journal.pone.0202326

Pan M, Meng A, Yin R, et al. Nursing Interventions to Reduce Peripherally Inserted Central Catheter Occlusion for Cancer Patients: A Systematic Review of Literature. Cancer Nurs. 2019;42(6):E49-E58. doi:10.1097/NCC.0000000000000664

Ray-Barruel G, Xu H, Marsh N, Cooke M, Rickard CM. Effectiveness of insertion and maintenance bundles in preventing peripheral intravenous catheter-related complications and bloodstream infection in hospital patients: A systematic review. Infect Dis Health. 2019;24(3):152-168. doi:10.1016/j.idh.2019.03.001

Webster J, Osborne S, Rickard CM, Marsh N. Clinically-indicated replacement versus routine replacement of peripheral venous catheters. Cochrane Database Syst Rev. 2019;1(1):CD007798. Published 2019 Jan 23. doi:10.1002/14651858.CD007798.pub5

Chopra V, Flanders SA, Saint S, et al. The Michigan Appropriateness Guide for Intravenous Catheters (MAGIC): Results From a Multispecialty Panel Using the RAND/UCLA Appropriateness Method. Ann Intern Med. 2015;163(6 Suppl):S1-S40. doi:10.7326/M15-0744

Swaminathan L, Flanders S, Horowitz J, Zhang Q, O'Malley M, Chopra V. Safety and Outcomes of Midline Catheters vs Peripherally Inserted Central Catheters for Patients With Short-term Indications: A Multicenter Study. JAMA Intern Med. 2022;182(1):50-58.

About the ABIM Foundation

The mission of the ABIM Foundation is to advance medical professionalism to improve the health care system. We achieve this by collaborating with physicians and physician leaders, medical trainees, health care delivery systems, payers, policymakers, consumer organizations and patients to foster a shared understanding of professionalism and how they can adopt the tenets of professionalism in practice.

To learn more about the ABIM Foundation, visit www.abimfoundation.org.

About the Society of General Internal Medicine

The membership of the Society of General Internal Medicine (SGIM) consists of academic general internal medicine faculty practicing, teaching and conducting research in outpatient settings as well as in our nation's teaching hospitals. As leading teachers of the next generation of physicians, we are committed to moving the practice of medicine to a more evidence-based approach. We are deeply committed to using science to improve our knowledge-base so that our patients can receive the best treatments, the optimal prevention care and the highest quality of life. We believe that the *Choosing Wisely* campaign mirrors these same commitments to the evidence-based practice of medicine for the benefit of our patients.

To learn more about the SGIM, visit www.sgim.org.

For more information or to see other lists of Five Things Physicians and Patients Should Question, visit www.choosingwisely.org.