



Choosing Wisely – 5 Things Physicians & Patients Should Question

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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.

Summary of Update

We searched MEDLINE (via Ovid), Embase (via Elsevier), and the Cochrane Library (via Wiley) for database-specific controlled vocabulary and keywords for preoperative testing. The search was developed and conducted by a professional medical librarian (SC) in consultation with the author team. The reproducible search strategies are publicly available via Open Science Framework (<https://osf.io/q4nk3/>). We included prospective and retrospective studies as well as systematic reviews, meta-analyses, and guidelines published from 2016 through 2022. We excluded animal-only studies as well as non-English studies. The search was conducted on February 14, 2022 and found 1417 citations. After the search, all identified studies were uploaded into Covidence (Veritas Health Innovation, Melbourne, Australia), a software for managing reviews, and 380 duplicates were removed. Two authors (DZ, HS) completed dual, independent screening at both the title and abstract stage, as well as the full-text screening phase. Conflicts were resolved through discussion. After screening 1037 citations, 970 were deemed irrelevant at the title and abstract screening phase. An additional 21 studies were excluded at the full text screening phase, and 45 studies were included (see Figure 1).¹⁻⁴⁵ Forty-one of the included studies supported the existing recommendation, and the exceptions are noted in the discussion below. On this basis, we reaffirmed the prior recommendation.

Discussion

For low-risk surgical procedures, such as cataract extraction, hernia repair and non-urgent orthopedic surgery on single joints, routine pre-operative laboratory testing does not impact surgical outcomes and may lead to delays in surgery during which time other harms, such as falls, can occur. Preoperative

assessment before low-risk procedures should be restricted to a careful history and physical examination and review of chronic medical conditions. Routine testing in these situations, such as blood testing, urinalysis and urine culture, chest radiograph and electrocardiogram should be avoided.

Some observational evidence utilizing the National Surgical Quality Improvement Program database from 2020 merits review. One retrospective cohort suggests that elevated white blood cell count and reduced hematocrit may be predictive of post-operative complications in benign hysterectomy.⁴¹ Another retrospective cohort found associations between abnormal values for sodium, blood urea nitrogen, and creatinine and adverse outcomes during total hip arthroplasty.⁴² We cannot glean from these cohorts whether a strategy of judicious ordering for patients with comorbidities or other risk factors would have identified the patients at risk without requiring global testing of all patients. These findings should be verified prospectively before impacting the overall recommendation.

The American Society of Anesthesiologists (ASA) Physical Status Classification System indicates patient fitness to undergo anaesthesia. For ASA class 3-4 patients (persons with severe systemic disease which may be a threat to life), renal function testing can be considered when there is risk for acute kidney injury and electrocardiogram can be considered if not performed in the prior 12 months. These and other detailed evidence-based testing recommendations as stratified by patient risk and surgical risk can be viewed at: National Institute for Health and Care Excellence, Clinical Guideline NG45, Routine preoperative tests for elective surgery, 2016 (<https://www.nice.org.uk/guidance/ng45>), and in other sources referenced.⁴³⁻⁴⁵

In summary, pre-operative testing should be undertaken only if such testing would have been indicated based on patient factors and clinical presentation, regardless of upcoming low-risk surgery.

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Figure 1
PRISMA Flow Diagram for the Choosing Wisely search update

