**Society of General Internal Medicine**  
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 for 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 avoidable costs. Clinicians should not routinely order testing before low-risk surgery.

**Summary of Update**  
We conducted a search of PubMed, EMBASE, and the Cochrane Library to identify systematic reviews, meta-analyses, clinical trials, and randomized controlled trials of pre-operative laboratory testing and imaging in patients undergoing low-risk surgical procedures. We included trials published from 2012 through 2015. After screening 490 citations, we found 12 relevant studies (see Figure 1). On this basis, we reaffirmed the prior recommendation, provided other examples of low risk surgeries where the evidence indicated that routine testing was not warranted, and offered new references regarding the low yield of other preoperative tests such as urinalysis, electrocardiogram (ECG), and pulmonary function testing (PFTs).

**Discussion**  
For low-risk surgical procedures, such as cataract extraction (the most common surgical procedure in Medicare patients) and hernia repair, the value of performing routine pre-operative laboratory testing is low. Testing very rarely leads to change in preoperative management, and abnormal results obtained as part of routine testing do not confer higher rates of perioperative complications. Preoperative assessment before low-risk procedures should be restricted to a careful history and physical examination, unless that assessment identifies new, unstable, or acute medical conditions that by themselves deserve additional laboratory evaluation, or surgery-specific indications for testing exist.

The scientific basis for the recommendation to avoid routine preoperative surgical testing, including ECGs, chest x-rays, and PFTs in low-risk patients undergoing minor surgical procedures include the following.
A recent comparative effectiveness review commissioned by the Agency for Healthcare Research and Quality (AHRQ) showed that testing panels (including complete blood counts (CBC), basic and extended metabolic panels, coagulation tests, urinalysis, ECG, and chest x-ray) conferred no clinically significant reduction in perioperative complications, procedure delay, or cancelation in cataract surgery, with insufficient evidence of any benefit in other surgeries. 

In a systematic review of American Society of Anesthesiologists’ (ASA) Physical Status class I and II grade adult patients undergoing minor to intermediate risk surgeries, such as non-cataract ophthalmic, general, and dental surgeries, abnormalities in preoperative CBC, electrolytes, and PFTs were uncommon in healthy patients and these abnormal results rarely influenced management.

A randomized controlled trial of 1,061 relatively low risk patients undergoing ambulatory surgery (plastic, general, urology, orthopedic, and non- cataract ophthalmologic procedures) showed no difference in perioperative adverse events between patients randomly assigned to testing and those assigned to no testing.

In a retrospective analysis of over 40,000 ASA class I-III patients having elective ambulatory hernia repair (a low risk surgery), routine testing with CBC, electrolytes, blood urea nitrogen, creatinine, liver enzymes, and coagulation tests did not reduce major or wound-related complications in patients without comorbidities.

In a systematic review of patients undergoing cataract surgery, the rates of intraoperative or postoperative medical complications did not differ between patients randomized to routine testing versus no testing or selective testing. Cataract surgery is an extremely low risk procedure; even patients with significant medical comorbidities can safely undergo this surgery.

Unsuspected clinically significant disorders of coagulation are rare. Routine pre-procedural testing is not needed, and can be limited to those with a personal or family history of abnormal bleeding or an underlying disease that promotes abnormal bleeding.

A recent systematic review of the impact of preoperative blood glucose and hemoglobin A1c screening of otherwise healthy adults demonstrated little benefit in patients undergoing low risk surgeries.

There is no high quality evidence that routine preoperative urinalysis improves outcomes in low risk surgery, except for urinary tract procedures, such as transurethral resection of the prostate.

According to the 2014 American College of Cardiology/American Heart Association’s Perioperative Clinical Practice Guideline on Perioperative Cardiovascular Evaluation, a routine preoperative resting 12-lead ECG before low risk surgery is not recommended for any patient population.

In a systematic review of 11 studies of PFTs (spirometry) before non-pulmonary surgery that adjusted for confounders, three studies reported modest ability to predict pulmonary complications, no study evaluated changes in clinical management, and one study reported no effect on mortality rates. The incremental value of spirometry beyond a careful history and physical examination is unknown, and no studies exist for spirometry before low risk surgery.

A Practice Advisory from the ASA recommends against routine preoperative testing if there are no clinical indications to justify the tests.

Despite compelling evidence in favor of no routine testing before low risk surgery (such as hernia surgery), physicians continue to order unnecessary preoperative tests.

In some instances, the charges for preoperative tests that are not medically indicated may not be covered by health plans, resulting in unreimbursed costs to patients.
In conclusion, routine preoperative testing before low-risk ambulatory surgeries, such as cataract extraction and hernia repair, can be eliminated. Tests should only be performed selectively based on patient-related or surgery-specific indications.

References
Figure 1
Results for Choosing Wisely search update

Studies
PubMed: 171
Embase: 365
Cochrane: 100
Total: 636

TITLES/Abstracts
490

DUPLICATES
146

EXCLUDED*
464
- No human data reported: 3
- Not a study of low risk surgical procedures: 405
- Includes only history and physical exam as an intervention: 6
- No comparison groups: 7
- No outcomes of interest: 225

ARTICLES
28

EXCLUDED†
14
- No human data reported: 0
- Not a study of low risk surgical procedures: 10
- Includes only history and physical exam as an intervention: 1
- No comparison groups: 1
- No outcomes of interest: 8

INCLUDED ARTICLES
12

* Sum of excluded abstracts exceeds 464 because reviewers were not required to agree on reasons for exclusion
† Sum of excluded articles exceeds 14 because reviewers were not required to agree on reasons for exclusion